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UNITED STATES NAVAL INSTITUTE
PROCEEDINGS

VOL. NO. 52, NO. 10 OCTOBER, 1926 WHOLE NO. 284

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Foreword

The significance and purpose of Navy Day have now become so well known to all officers of the Navy and Marine Corps that no comment is necessary other than to invite attention to the following pages, which have been contributed by the respective authors. The "Comparative Data for Treaty Navies" will be found on page 2048.

The Board of Control has authorized this Special Information Number in the hope that it will assist in making our fellow citizens better acquainted with their Navy.

From a picture presented to Navy Department Library by Lieutenant Commander R. Wainwright, U. S. N.

PRESIDENT ROOSEVELT ON BOARD U. S. BATTLESHIP "CONNECTICUT" AFTER CRUISE AROUND THE WORLD
Hampton Roads, Va.

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PRESIDENT ROOSEVELT ON BOARD U. S. BATTLESHIP "CONNECTICUT" AFTER CRUISE AROUND THE WORLD
Hampton Roads, Va.

THE SECOND ELEMENT IN SEA POWER

BY T. DOUGLAS ROBINSON, ASSISTANT SECRETARY OF THE NAVY

THE British axiom "Trade follows the flag" is the key to the national prosperity of the United States. In recent years and more particularly since the World War, American men-of-war have been busily engaged in "showing the flag" in the seven seas and ports of the world. The officers and men of the Navy have everywhere left the stamp of American individuality and everywhere have secured the respect and consideration that is the due merit of a great nation. Wherever the American flag has been carried by our splendid fighting machines it has been on a mission bent not upon destruction or aggression, but to succor and assist less fortunate peoples and to establish an *entente cordiale* between the American Republic and the nations of the earth. The personnel of our Navy deserve the greatest praise for the uniform and consistent way in which they have cultivated a deep rooted and lasting friendship between our people and the nationals of other countries. It is an unfortunate fact, however, that the United States has not made the most of these splendid opportunities for commercial development. While the flag has proceeded unmolested over the face of the earth and received a hearty welcome, the carriage of our foreign trade has been allowed to lag behind. Each year since the close of the World War has seen a further deterioration in the greatest single agent of American prosperity. The people of the United States should be vitally interested in the American merchant marine from the point of national prosperity as well as security. The

personnel of our Navy should realize that an adequate merchant marine in peace is essential to the prosecution of a great naval war in time of trouble.

The fifth anniversary of Navy Day will be celebrated on October 27 under the auspices of the Navy League of the United States. October 27 was selected as Navy Day on account of its being the birthday of Theodore Roosevelt, twenty-sixth president of the United States, who throughout his life bent his energies to the perpetuation of American institutions and particularly the integrity of American seapower. The sponsors of Navy Day will in their annual celebration this year emphasize the importance to the nation of our peace-time place upon the high seas. To inform the American public of the importance of this industry to our national prosperity and national security is the primary object of Navy Day 1926.

Six per cent of the productive effort of the American people must find an outlet beyond our shores. This means that one out of every sixteen individuals gainfully employed in the United States works solely for the foreign markets. If those people are to continue to enjoy the prosperity and high standard of living which is now second nature, our country must insure the unmolested transportation of the surplus of farm and manufactured products to our foreign customers. While the United States has always adhered to the proposition that the high seas are the common property of all nations, other countries have from time to time seen fit to disregard this opinion. On at least three occasions in a relatively short national existence our country has resorted to arms to defend this principle. The fathers of the Republic early realized the importance to a nation such as ours, rich in natural resources, of free movement of our carrying trade. In fact our Navy had its inception in the desire of the American people to protect their merchantmen from the Barbary pirates. The United States' entry into the late war swiftly followed a threatening menace to American merchant shipping. Germany's declaration of unrestricted submarine warfare jeopardized our national prosperity. From this war we emerged with a powerful Navy and an adequate merchant marine—ample assurance of our economic independence. Our position in 1919 was decidedly favorable. No longer were we as a nation dependent for a continued prosperity

upon the whims, eccentricities, or peace conditions of any other nation. Our position was an enviable one.

When the representatives of the great maritime powers of the world assembled in Washington in 1921, we were in a position to make generous sacrifices. These sacrifices are known to the world. As a material evidence of our good intentions we scrapped splendid fighting craft of the post-Jutland type—in some cases ninety per cent completed.

As a further evidence of this nation's abhorrence of war and a sincere desire for international good will, we have recently sent a delegation to the preliminary arms conference at Geneva. If any practical scheme can be evolved for the further limitation of land or naval armaments, we may be very certain this country will not be loathe to again set the example. It must be borne in mind however that from a strictly military point of view the further the limitation of armament is carried the more important becomes the merchant marine. Correspondingly as we reduce the number and size of fighting craft the value of our merchant fleet for war purposes increases until in the final analysis the total abolition of naval armaments would place the nation with the largest fleet of merchant vessels as the great naval power of the world.

In a world where navies were outlawed the nation with a fleet of swift passenger vessels under her flag would be the great maritime power of the earth. There are today afloat trans-oceanic liners constructed of steel with gun mount installations which could be converted into commerce raiders and cruisers within a week's time. Should limitation of naval armament ever reach that stage these are the potential capital ships of the morrow. Aside from their capacity as converted cruisers such vessels would be indispensable to any nation desiring to carry hostilities into territory other than her own. The slow moving cargo vessels if in sufficient quantity could supply the fleet with tender facilities but to act as transports, prospective aircraft carriers, and to supplement the fighting arm of the fleet, fast converted liners would be essential. The United States stands next to Great Britain in actual merchant ship tonnage. The British Empire has 309 vessels ranging in speed from fifteen to nineteen knots while the United States has fifty-one, the former nation outranking this country six to one in

fast liners. France runs second to Great Britain with seventy-eight such vessels, Italy having thirty, and Japan nineteen. When considering the sea power of any nation it is well to have in mind such figures.

Our presidents one and all have been advocates of American sea power. It is a fact worth noting that where the Navy of the United States has been concerned no phase of political faith or party feeling has ever been injected into the question. As the spokesmen of the American people it may be well to review the opinion of some of our great leaders regarding a merchant marine.

George Washington

December 8, 1790

I recommend it to your serious reflections how far and in what mode it may be expedient to guard against embarrassments from these contingencies by such encouragements to our navigation as will render our commerce and agriculture less dependent on foreign bottoms, which may fail us in the very moments most interesting to both these great objects. (General peace and security of the United States.)

John Adams

November 22, 1797

The commerce of the United States is essential if not to their existence at least to their comfort, their growth, prosperity, and happiness. The genius, character, and habits of the people are highly commercial. In short, commerce has made this country what it is and it can not be destroyed or neglected without involving the people in poverty and distress. Great numbers are directly and solely supported by navigation. The faith of society is pledged for the preservation of the rights of commercial and seafaring no less than of other citizens.

Thomas Jefferson

December 16, 1793

But it is as a resource of defense that our navigation will admit neither neglect or forbearance. The position and circumstances of the United States leave nothing to fear on their landboard, and nothing to desire beyond their present rights. But on their seaboard they are open to injury, and they have there too, a commerce which must be protected. . . . .

The carriage of our own commodities, if once established in another channel, cannot be resumed in the moment we may desire. If we lose the seamen and artists whom it now occupies, we lose the present means of defense, and time will be requisite to raise up others, when disgrace or losses shall bring home to our feelings the error of having abandoned them.

Franklin Pierce

December 4, 1854

Our foreign commerce has reached a magnitude and extent nearly equal to that of the first maritime power of the earth, and exceeding that of any other. Over this great interest, in which not only our merchants, but all classes of citizens, at least indirectly are concerned, it is the duty of the executive and legislative branches of the government to exercise a careful supervision and adopt proper measures for its protection.

Ulysses S. Grant

December 5, 1870

Our depressed commerce is a subject to which I called your special attention at the last session, and suggested that we will in the future have to look more to the countries south of us, and to China and Japan, for its revival. Our representatives to all these governments have exerted their influence to encourage trade between the United States and the countries to which they are accredited. But the fact exists that the carrying is done almost entirely in foreign bottoms and while this state of affairs exists we cannot control our due share of the commerce of the world, that between the Pacific States and China and Japan is about all the carrying trade now conducted in American vessels. I would recommend a liberal policy toward that line of American steamers—one that will insure its success, and even increased usefulness.

(Second Annual Message, December 5, 1870)

Rutherford B. Hayes

December 3, 1877

The commerce of the United States with foreign nations, and especially the export of domestic productions, has of late years largely increased, but the greater portion of this trade is conducted in foreign vessels. The importance of enlarging our foreign trade, and especially by direct and speedy interchange with countries on this continent, cannot be overestimated; and it is a matter of great moment that our own shipping interests should receive, to the utmost practical extent, the benefit of our commerce with other lands. These considerations are forcibly urged by all the large commercial cities of the country, and public attention is generally and wisely attracted to the solution of the problems they present. It is not doubted that Congress will take them up in the broadest spirit of liberality and respond to the public demand by practical legislation upon this important subject.

(First Annual Message, December 3, 1877)

Chester A. Arthur

December 6, 1881

The continuing decline of the merchant marine of the United States is greatly deplored. In view of the fact that we furnish so large a propor-

tion of the freights of the commercial world and that our shipments are steadily and rapidly increasing it is a cause of surprise that not only is our navigation interest diminishing, but it is less than when our exports and imports were one half so large as now, either in bulk or value.

(First Annual Message, December 6, 1881)

Benjamin Harrison

December 3, 1889

There is nothing more justly humiliating to the national pride and nothing more hurtful to the national prosperity than the inferiority of our merchant marine compared with that of other nations whose general resources, wealth, and seacoast lines do not suggest any reason for their supremacy on the sea. It was not always so, and our people are agreed, I think, that it shall not continue to be so. . . . . That the American lines of steamships have been abandoned by us to an unequal contest with the aided lines of other nations until they have been withdrawn, or in the few cases where they are still maintained are subject to serious disadvantages, is matter of common knowledge.

(First Annual Message, December 3, 1889)

William McKinley

March 4, 1897

Commendable progress has been made of late years in the upbuilding of the American Navy, but we must supplement these efforts by providing as a proper consort, a merchant marine amply sufficient for our own carrying trade to foreign countries. The question is one that appeals both to our business necessities and the patriotic aspirations of a great people.

December 5, 1899

The reestablishment of our merchant marine involves in a large measure our continued industrial progress and the extension of our commercial triumphs. I am satisfied the judgment of the country favors the policy of aid to our merchant marine, which will broaden our commerce and markets and upbuild our sea-carrying capacity for the products of agriculture and manufacture; which, with the increase of our Navy, means more work and wages to our countrymen, as well as a safeguard to American interests in every part of the world.

December 3, 1900

American vessels during the past three years have carried about nine per cent of our exports and imports. Foreign ships should carry the least, not the greatest, part of American trade. The remarkable growth of our steel industries, the progress of shipbuilding for the domestic trade, and our steadily maintained expenditures for the Navy have created an opportunity to place the United States in the first rank of commercial maritime powers.

Besides realizing a proper national aspiration this will mean the establishment and healthy growth along all our coasts of a distinctive national industry, expanding the field for a profitable employment of labor and capital. It will increase the transportation facilities and reduce freight charges on the vast volume of products brought from the interior to the seaboard for export, and will strengthen an arm of the national defense upon which the founders of the government and their successors have relied. In again urging immediate action by the Congress on measures to promote American shipping and foreign trade, I direct attention to the recommendations on the subject in previous messages.

THEODORE ROOSEVELT

January 23, 1907

It would surely be discreditable for us to surrender to our commercial rivals the great commerce of the Orient, the great commerce we should have with South America, and even our own communications with Hawaii and the Philippines.

WOODROW WILSON

December 7, 1915

To speak plainly, we have grossly erred in the way in which we have stunted and hindered the development of our merchant marine.

The merchants and farmers of this country must have ships to carry their goods.

It is of capital importance not only that the United States should be its own carrier on the sea and enjoy the economic independence which only an adequate merchant marine would give it, but also that the American hemisphere as a whole should enjoy a like independence and self sufficiency if it is not to be drawn into the tangle of European affairs.

There are other great matters which will be thrust upon our attention whether we will or not. There is, for example, a very pressing question of trade and shipping involved in this great problem of national adequacy. It is necessary for many weighty reasons of national efficiency and development that we should have a great merchant marine. The great merchant fleet we once used to make us rich, that great body of sturdy sailors who used to carry our flag into every sea, and who were the pride and often the bulwark of the nation, we have almost driven out of existence by inexcusable neglect and indifference and by a hopelessly blind and provincial policy of so-called economic protection. It is high time we repaired our mistake and resumed our commercial independence on the seas.

WARREN G. HARDING

April 12, 1921

The Republic can never realize its righteous aspirations in commerce, can never be worthy of the traditions of the early days of the expanding Republic, until our shipping has government encouragement, not govern-

ment operation, in carrying our cargoes under our flag, over regularly operated routes, to every market in the world agreeable to American exchanges. It will strengthen American genius and determination because carrying is second only to production in establishing and maintaining the flow of commerce to which we rightfully aspire.

CALVIN COOLIDGE

December 6, 1923

The entire well-being of our country is dependent upon transportation by sea and land. Our government during the war acquired a large merchant fleet which should be transferred as soon as possible to private ownership and operation under conditions which would secure two results, first, and of prime importance, adequate means for national defense; second, adequate service to American commerce.

AMERICA'S ECONOMICAL DEPENDENCE ON FOREIGN TRADE

By Walter Bruce Howe, President Navy League

ONE more popular belief must fall before anything like a sound economic policy can be achieved by the United States. It is the belief that, as a nation, we are self-sufficient—that, if need be, we could draw into our continental borders, erect an imaginary Chinese wall around ourselves and continue to live and thrive. It is a belief that is nine parts delusion.

It is a fallacy that is supported on the surface by many facts. The economic position of the United States today is the envy of the world. Our fabulous crops of wheat and food stuffs, our leadership in the manufacture of steel and the products of steel, the growing of sixty per cent of the world's cotton and the existence of a million cotton spindles, the refining of three-fourths of the world's petroleum and the mining of half its copper all lend color to the general feeling of self-sufficiency. We have an excellent organization for the production of many of the necessities of life, good transportation and communications within our borders and perhaps the strongest financial position the world has yet seen.

Above the material things of life, but making for our prosperity, are a sound constitution and a workable democracy, an intelligent electorate, a good average of physical fitness, a high standard of living, and a growing understanding between capital and labor. None of these things is, of course, perfect but all are far above the average for the world as a whole.

Indeed, with the exception of Russia, we are more nearly self-sufficient than any other great country. But even that leaves us far from being self-sufficient.

Our annual production, according to figures given in the *1925 American Year Book,* is around $80,000,000,000. Our exports for the same year were over $4,864,000,000, or six per cent of the total production. It is not difficult to see, therefore, that, approximately, six per cent of our 50,000,000 of citizens who are

listed as gainfully employed by the United States census are dependent for their livelihood on our foreign markets. Three millions of our inhabitants and their families would be deprived of their living should our foreign commerce suddenly disappear, an event that is almost impossible to conceive, but it serves to illustrate the error of those who fatuously proclaim that as a nation we are self-sufficient.

With 3,000,000 of unemployed our whole economic life would be subjected to a strain with its concomitants, depression or panic, hard times, suffering, discontent.

The curtailment of one or more of our foreign markets would adversely affect a number of our people in proportion to the size of that market.

Of course the burden of the curtailment or the destruction of our foreign markets would fall more heavily on some classes and some regions than on others, but the prosperity of all would be diminished.

Bound up in our growing trade is the prosperity of the farmer, manufacturer, transporter, middleman, retailer, and laborer.

Our cotton crop averages around $1,500,000,000 each year and over half of this finds a market overseas. While we consume most of our grain at home, the ten per cent that is sold abroad is an important factor in making the price. Foreign buyers of meat and animal products form twenty per cent of the total and the foreign market enters substantially into the totals for many other farm products.

As we come to manufacturing the figures are no less impressive. According to the 1923 figures—the last available—the United States has sixteen billion-dollar manufacturing industries, so called because they produce annually more than $1,000,000,000 each. Among them are the industries producing motor vehicles, iron and steel, packed meats, foundry and machine-shop products, cotton goods, refined petroleum, lumber and timber, electrical machinery, clothing and shoes, printing, and flour. Together they employ over 3,500,000 wage earners whose employment and high standard of living are vitally dependent upon the sale of surplus products in foreign countries.

But it is not only the six per cent of our people engaged in producing goods for foreign markets who are dependent on foreign trade. No one of the industries above named could long

continue to operate on an economical basis were it not for scores of articles imported from other countries.

William C. Redfield, former Secretary of Commerce, has recently shown in his book, *Dependent America,* that imports intimately touch the lives of every American. They are in our food and our clothing; in our furniture and our houses; in our automobiles, telephones and lights; in our warships and materials for national defense; in our newspapers and the type that prints them; and in the fertilizer for our farms. These are not luxuries. They are essential in harvesting and shipping our crops, in building our great bridges, in making the rails on the curves of railroads which must stand the hardest strain, in providing safe axles and steering-rods for automobiles and in providing tires for them. From our morning toothbrush to our evening pillow we utilize, in one form or another, literally hundreds of imported articles or articles finished with the aid of imports.

The United States War College has made a study of essential war materials not produced in the United States or which are produced in quantities insufficient even for peace-time requirements. They include chromium and manganese, essential in the production of high-grade machine steel and armor; hemp, jute and manila fibre which have a thousand uses but the most important of which is in harvesting crops. Antimony, nickel, platinum, quicksilver, tin and tungsten are some of the metals essential to the great age of machinery upon which the United States is dependent. They do not occur in quantities to suffice a fraction of our needs.

Wool and silk are textile materials in the same class. Coffee and sugar are foods which a war-time population might do without but the Army lists them as essentials. Essential medicines of which we have no native supply are opium, quinine, camphor, and nux vomica. Few of these materials have satisfactory substitutes. They are needed by every one of the big sixteen industries and ninety-five per cent of all other industries for peace-time production as well as for purposes of war.

If the American people ever realize their dependence on foreign trade they will see the futility of leaving ocean transportation in the hands of our commercial rivals. The possible consequence of our present practice of leaving the bulk of our foreign commerce to ships under alien flags is illustrated by the situation which

arose the latter part of 1914 when the great shipping powers were preoccupied in moving troops and supplies, following the outbreak of the world war. Our docks and depots were piled high with goods, our freight yards congested with material for which there was a ready market abroad, but troops and supplies in the strategic theaters were even more important to the warring countries. The United States had few ships. The cotton farmer was bankrupt. A nation-wide "Buy a bale of cotton" campaign was instituted to save him from permanent ruin. And similar effects were felt in many other fields.

It is sound economic policy to own that bridge beyond the railroads which reaches out to foreign lands and insures the uninterrupted flow of goods and markets vital to the American people.

Not only is it sound as a measure of protection, but a merchant marine under the United States flag would create wealth for the country. Direct sailings to the principal markets of the world would enable American farmers and manufacturers to sell in those markets whereas roundabout sailings and trans-shipment close many of these markets to our products. The carrying charges, insurance premiums and seamen's wages involved in our nine billion-dollar foreign trade would be sufficient to add shipping to the big sixteen billion-dollar industries.

THE NAVY AND THE MERCHANT MARINE

By Admiral E. W. Eberle, U. S. Navy
Chief of Naval Operations

NAVAL power and foreign trade go hand in hand.

Our foreign trade, amounting to more than $8,000,000,000 annually, depends largely on its transport in foreign bottoms. In time of war this foreign tonnage will probably be denied us, thus resulting in a more or less complete stagnation of our foreign trade.

A merchant marine is a vital necessity if the United States is ever to enjoy commercial security.

In the Merchant Marine Act, 1920, Congress definitely states,

> That it is necessary for the national defense and for the proper growth of its foreign and domestic commerce that the United States shall have a merchant marine of the best equipped and most suitable types of vessels sufficient to carry the greater portion of its commerce and serve as a naval or military auxiliary in time of war or national emergency, ultimately to be owned and operated privately by citizens of the United States; and it is hereby declared to be the policy of the United States to do whatever may be necessary to develop and encourage the maintenance of such a merchant marine.

In our war with Spain, we found ourselves without an adequate marine auxiliary to our Army and Navy and were forced to use merchant ships unsuitable for the duty required and in some cases found it necessary to purchase ships of foreign register in order to provide the necessary supplies for our fighting ships.

During the Boer War, hard times came to America due to Great Britain's withdrawal of a large number of merchant vessels from her oversea trade and diverting them to war uses. In 1915-16 we again experienced the difficulties that arise when railway terminals at the seaboard are congested, with no shipping available for this transportation.

The World War gave the United States the opportunity of building a merchant marine and at the close of the war our marine tonnage was second only to that of Great Britain. Our reason for

building up this great tonnage was primarily to support our fighting forces in Europe.

The old saying that "an army fights on its stomach" applies equally well to the Navy, as the logistic problem of the Navy in any overseas campaign is one of vital importance and can only be met by having ready an adequate merchant marine capable of taking care of the fleet's logistic needs.

Since the World War, the United States, having available a large marine tonnage built during the war, has endeavored to build up its commerce but we have found that the mere possession of a large and expensive fleet of merchant vessels does not necessarily guarantee an efficient and successful merchant marine.

Owing to our shipping laws, and the high rate of pay of our merchant marine personnel, we find it difficult to compete with foreign nations in sea trade especially when we consider that foreign nations grant liberal subsidies to private companies in order to have available in time of war, suitable types of merchant vessels for use as naval auxiliaries.

Every naval power in the world except the United States depends on its merchant marine for its naval reserve. The United States on the other hand is largely dependent on the Navy for providing trained personnel to man its merchant vessels in an emergency.

For many years our people felt that the United States, being separated from other great nations by the Atlantic and Pacific oceans, occupied a position of security. The World War showed us that distance by sea is no barrier to the nation having at its disposal the required fighting ships and merchant marine. The movement across the Atlantic of several millions of men, and a large part of the supplies necessary to maintain these men at the front, was only possible because of Great Britain's large merchant marine and the availability to the United States of a number of German liners that were seized by the United States after we entered the war.

In 1789, James Madison, subsequently President of the United States, said,

> Were it not for the necessity we are under of having some naval strength, I should be an advocate for throwing open the doors of our commerce to all the world and making no discrimination in favor of our own citizens. But we have maritime dangers to guard against and we can be secured from

them in no other way than by having a Navy [Marine] and seamen of our own.

In developing a merchant marine, a government must have in view the value of commercial vessels to the nation in time of war. Fast passenger and mail vessels will then be required for transporting troops. They may be fitted out as auxiliary cruisers, or converted into airplane carriers. Combined passenger and cargo vessels will serve as troop transports and for the carrying of equipment. Cargo vessels will be required to supply the logistic needs of the fleet. We cannot afford to concentrate on one particular type of ship, as a well balanced merchant marine is necessary to meet the needs of our foreign trade as well as to provide for the requirements of national defense.

As our foreign trade expands, our lines of communication extend to all parts of the world. In time of war, these trade routes will require the Navy's protection to insure an outlet for our excess products as well as to guarantee the arrival in our ports of essential products which are vitally necessary to us in the manufacture of munitions.

In the first few months of the World War we saw how a few German cruisers and auxiliary cruisers crippled, to a considerable extent, Great Britain's merchant sea trade.

Great Britain, realizing, for many years past, that her sea trade was her greatest asset, had built a navy that was capable of guarding her long lines of communications and was therefore able not only to contain the German fleet but also to despatch cruisers to all parts of the world in order to keep open her vital lines of communication.

Our people are apt to consider the Navy only as a force designed to meet the enemy in battle. The people and the government must be brought to realize that the Navy is responsible in war for keeping open our vital lines of communication.

The Navy is ready to cooperate to the fullest extent in the creation of an adequate merchant marine. For a number of years past the Navy has loaned gun boats to several states which maintain nautical schools and has contributed about $25,000 a year to these states to help maintain each ship. Two fully equipped ships with officers and men for operating them have been loaned to the Bureau of Fisheries. Our men-of-war cruising in all parts of the world are ready at all times to render assistance to merchant ship-

ping of all countries. The Naval Communication Service broadcasts daily the Weather Bureau's weather reports and also a daily time signal. Our monthly weather charts and our Hydrographic Office charts are used constantly by mariners of all nations. Thus is the Navy contributing at all times to the needs of merchant shipping.

To be able efficiently to carry out the Navy's mission in time of war, we must be provided with the necessary types of naval vessels required for our different tasks. Fast cruisers, with long cruising radius and high offensive power, are required for fleet operations as well as for guarding our vital lines of communications. We are sadly deficient in this type of vessel at the present time and, in case of war, would find it difficult to spare any of this type of vessel to guard our commercial sea lanes.

At least twenty additional cruisers are required to bring our ratio up to the proper standard relative to Great Britain and Japan.

In aircraft carriers, we are about 69,000 tons below the limit established by the Washington Treaty. As soon as experiments with the *Lexington* and *Saratoga* demonstrate the type of aircraft carrier most suitable for our needs, we should build up to our allowed tonnage without delay, as aircraft carriers will be one of our most valuable units in time of war for fleet operations as well as for guarding our sea-borne trade.

The Washington Treaty does not limit the building of vessels of less than 10,000 tons. We are now seeing the different nations engaged in designing ships of less than this tonnage with a speed of 35 knots, and possessing a cruising radius of more than 10,000 miles; also carrying an armament of greater offensive power than was carried a few years ago by vessels of considerably greater tonnage.

Destroyer leaders, of which we have none, are being added to the navies of Great Britain and Japan, thus adding to the fighting strength of their fleets. Although we are superior in numbers of destroyers to both Great Britain and Japan we have not added a single new destroyer to the Navy in the past six years. On the other hand Great Britain and Japan are providing for a certain number of this type of vessel each year and are therefore improving the efficiency of their fleets by replacing the older and less efficient destroyers by modern ones of much greater offensive power.

In submarines we are superior to England and Japan in numbers but our superiority is not so great as it appears. A large number of our submarines are old and of insufficient cruising radius to accompany the fleet in an over-sea campaign. This coastal type will be useful in guarding our sea lanes within a reasonable striking distance of our coasts but we require the fleet type in sufficient numbers to accompany the fleet and to operate in enemy waters against his lines of communication.

We must not consider only the material side of our fleet. A trained personnel sufficient to man, not only those ships in commission, but ships that will be commissioned on the outbreak of war, is of vital importance. Mahan says, "Good men in poor ships have invariably triumphed over poor men in good ships."

In our last war, the Navy was called upon to provide officers and men for our merchant marine. On account of Great Britain's Navy having contained the German high seas fleet, practically all our Navy's personnel was available to supply our merchant vessels with the required personnel to man them. In another war, conditions may be very different. The fleet will need all of its personnel and must look to the merchant marine to carry on without drawing on the Navy, except such vessels as may be necessary for the Navy to take over for the full period of the war. Our trained reserves must be sufficient to man these vessels taken over as well as to man vessels now out of commission. At present Great Britain has about 65,000 men as an available reserve, Japan 39,000, and the United States 25,000.

The functions of the Navy are not confined to war. In time of peace, it represents the nation on all the seas and in the ports abroad, protecting its citizens and its commerce, safeguarding its rights, extending its courtesies. The Navy is ever ready to render signal aid in emergencies and to uphold the traditions of its years of honorable service.

SOME PERSONNEL ACCOMPLISHMENTS

By Rear Admiral W. R. Shoemaker, U. S. Navy,
Chief of the Bureau of Navigation

THE Navy can be no better than its officers and men. While the Bureau of Navigation is charged with responsibility for supervising personnel administration in the Navy, this must and does receive the constant attention of every officer and man in the service, and it has been only through such attention that our personnel has made such marked improvement during recent years.

The first reason for the improvement in our enlisted personnel is the improved quality of our recruits. Due to the fact that the past few years there were not many expirations of enlistments only a relatively small number of new recruits was required. This allowed the recruiting service to develop and utilize improved methods of selective recruiting, so as to obtain men of the highest quality, who would have no excuse to avoid serving their full enlistments. All men applying for enlistment, except those manifestly over twenty-one, must produce documentary evidence that they are over the legal age limit; all men under twenty-one must present the written consent of a parent or guardian. Married men are not enlisted without the written consent of their wives. A confidential report from an employer or two character references are required from every applicant. In other words "drifters" are not wanted in the Navy. Each recruit must have a previous civilian history which shows proper home environment and previous good habits. In this way the bureau protects the service and insures that the money appropriated by Congress is economically expended.

Due to the large number of enlistments which will expire during the year beginning July 1, 1926, a great increase in recruiting was necessary from that date and there was some doubt as to whether the necessary 500 men a week could be obtained without lowering the standards for acceptance. An expansion and reorganization of the Recruiting Service was, therefore, necessary; and in con-

sequence, the average for the first four weeks of the recruiting drive has been 555, exceeding all expectations.

The operation of training stations has been standardized and the eight-week course designed to concentrate on the four essentials for a recruit: to care for himself and his outfit, to be proficient in infantry drill, to pull an oar, and to swim. Training courses in pamphlet form have been issued to all ships so that the men afloat may continue their training. The present plan is to have courses to fit men for promotion to each rating in the Navy, thus not only increasing the knowledge of the enlisted personnel, but standardizing it. Some forty such training courses have been issued and fourteen per cent of the men are now studying them voluntarily. A number of educational moving pictures are being used in training the enlisted personnel. Those thus far made cover oil burning boilers, turbines, Diesel engines, gasoline engines, and storage batteries. A new system for selecting men for advanced training insures that it will be given only to those who will be able to assimilate it.

In order more equitably to distribute the enlisted personnel in accordance with the needs of the various ships it became necessary to revise the existing system of complements. The complements had grown up largely in accordance with the desires of the individual commanding officers, and those for similar or nearly similar ships presented glaring inconsistencies. The same differences existed in the distribution of men among the different pay grades and there was generally an excess of chief petty officers, many of whom were performing the duties regularly assigned to first class petty officers before the war. A new system of complements, therefore, was placed in effect the first of last July and this will undoubtedly give very near the maximum value for the $68,000,000 appropriated to pay enlisted men during this fiscal year.

The bureau has endeavored to increase the contentment of the men by improvement of moving pictures and crew's libraries, by the encouragement of mass athletics, and by making life aboard ship more comfortable.

The increased efficiency and contentment of the men are reflected by the detailed figures for the fiscal year 1926 as compared with those for the previous year. The percentage of re-enlistments has increased from seventy-two to seventy-five; the percentage of losses other than by expiration of enlistment has dropped from

13.3 to 10.2; the percentage of desertions from 5.4 to 3.2. The number of courts-martial has been considerably reduced.

Our officer personnel now is undoubtedly at a very high level and the system of requiring line officers to be available for all line duties provides a flexibility which will be even more advantageous in war than in peace time. A notable step in the improvement of the officer personnel is the formation of the junior course at the War College. A proper knowledge of strategy and tactics cannot be imparted in the senior course alone; the junior class will give officers an excellent groundwork in these studies early in their careers and permit them further to develop their knowledge by practical experience at sea and through reading, so that when they become due for the senior course, they will be prepared for work far in advance of that attempted in this course under present conditions. The junior course also provides well equipped young officers for staff work. In order to encourage reading throughout the service the bureau has put in effect a system by which any officer can obtain such professional books as he desires. Our very complete system of gunnery exercises, full power runs, engineering competitions, tactical exercises and strategic maneuvers on a large scale are thoroughly grounding our officers in practical tactics and strategy.

The post graduate school in material subjects has been expanded and 169 officers are now under instruction. These highly specialized officers naturally are greatly improving both the operating efficiency of the fleet and the design of material ashore. Within a few years all the requirements for post graduate officers afloat should be filled.

A system of aviation training, which will ground the line of the Navy in aviation, and provide the qualified aviators necessary for the expansion of our air arm, is now in complete operation. It consists of four stages:

(a) Instruction in ground subjects for all midshipmen during the last two academic years.

(b) Completion of the regular ground course and ten hours practical work in the air by all ensigns in a three-month period at the academy after graduation.

(c) Assignment of all ensigns for one month during the first two years afloat to a naval air station for twenty-five hours flying instruction.

(d) Assignment of the best qualified ensigns for an eight-month course at a naval air station to qualify as naval aviators. There will be three such classes commencing annually, in addition to one for enlisted men.

In September the Naval Reserve Officers' training corps was put in operation. This system, following generally that used so successfully by the Army, will be established in six large universities: two in the east, one in the south, one in the middle west, and two on the west coast. Three commissioned officers are being ordered to each university to establish a four-year course in naval science and tactics. Each class will start with about fifty students and it is hoped, when all four classes are formed, that a total of 960 students under training will be reached. The course of study will in essentials parallel that at the Naval Academy. Upon completion of the four-year course, the students will be encouraged to accept commissions as ensigns in the Naval Reserve.

The naval reserve has now been operating in its new organization for over a year and the results are gratifying. The new organization is along sound lines and each fleet division is being prepared for a ship designated by name, for which it will provide about seventy-five per cent of the personnel, the remainder coming from the regular Navy or classes of the naval reserve in which long naval service is required. This summer the various fleet divisions are being cruised as units, mostly on regular naval vessels of the type they are designated to man in war time. During the last year all reserve divisions were inspected by boards appointed by the Secretary of the Navy. A board formed of officers attached to this bureau inspected about one-third of the divisions, so that an accurate practical insight into reserve matters could be obtained. During the present fiscal year a special board organized in the bureau will inspect all the divisions of the naval reserve.

The aviation reserve is now organized in ten air squadrons distributed among the naval districts. Four aviation stations—at Squantum, Massachusetts; Rockaway, New York; Great Lakes, Illinois; and Sand Point, Washington—are now providing preliminary flight training for about eighty-eight aviation officers a year. Advanced flight training is provided at regular naval air stations. By the end of the summer training season there will be about 280 aviation officers in the ten squadrons, of whom about 210 will be in the fleet reserve. A five-year program has been

adopted to bring the squadrons to their full officer strength and the enlisted personnel to about sixty-five per cent full strength.

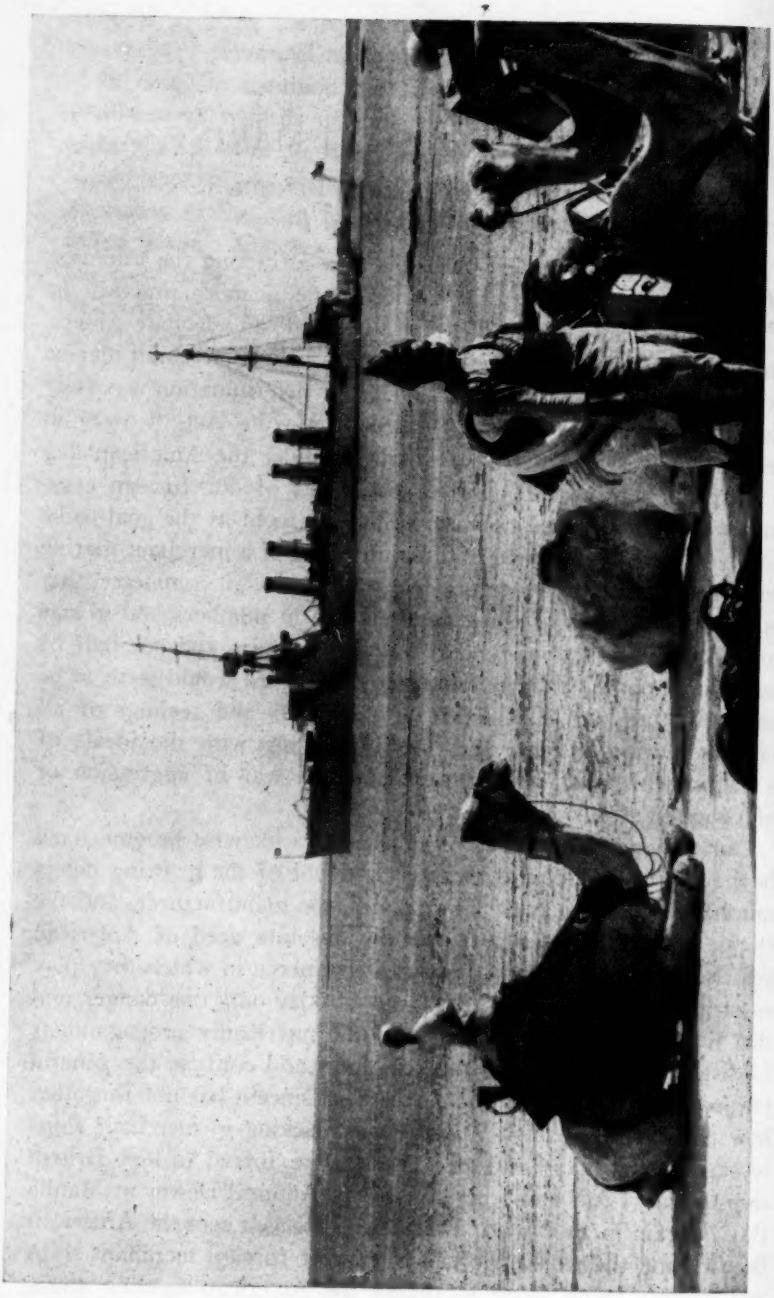
In order to maintain the Navy in a proper condition of war readiness as regards personnel, the bureau has prepared a complete plan for the personnel mobilization of all the vessels which would probably be required in war and the officers to whom the execution of the plan has been delegated are preparing their detailed plans. Officers of the bureau, in cooperation with the Marine Corps and the general staff of the Army, are drafting a Selective Service Law and regulations based upon it, which will be adapted to the needs of their services.

OUR NEW MERCHANT MARINE

By Rear Admiral (Retired) W. S. Benson, U. S. Navy
Member U. S. Shipping Board

AMONG the so-called problems now attracting the attention of the people of this country none is more practical or more clean-cut than the plan to provide an adequate American merchant marine. Whether we are to have a merchant marine is no longer a matter for discussion. Our determination was fully and finally expressed in the Merchant Marine Act of 1920 in which it is provided that there shall be under the American flag a merchant marine adequate for the needs of our foriegn commerce and for national defense. That act fixed as the goal to be achieved the establishment and maintenance of a merchant marine sufficient to carry fifty-one per cent of our foreign commerce, that is to say, composed of ships large enough in numbers and in size to transport merely one-half of our own exports and one-half of our own imports. Our ambitions in this regard would seem to be eminently fair and considerate of the rights and feelings of all other seafaring nations, and it is in keeping with the ideals of a nation which has never entered upon a war of aggression or of conquest.

Our national policy thus established has likewise become fixed in the popular mind, and there is no doubt of the growing determination to carry it out. The farmer, the manufacturer, and the shipper have all come to realize the absolute need of American vessels as a safeguard to American commerce in which they play so prominent a part. Indeed, there is today only one danger and that lies in the concerted efforts of the unfriendly propagandists to distract attention from the real facts and confuse the general purpose. But the country is on the alert since it has not forgotten how during the Spanish War we were lacking in merchant ships to support the Navy and as a result were forced to hire British ships to carry fuel and other supplies to Admiral Dewey at Manila Bay. Again in 1908 when President Roosevelt sent the American fleet around the world, we had to charter foreign merchant ships and colliers to go along to supply the American fighting ships,



U. S. S. "CONCORD" AT PORT SOUDAN

and then in the late World War we had to depend largely upon the ships of our allies to carry men, ammunition, and stores across the sea. Our Navy is ineffective without merchant ships as an auxiliary in time of war.

However, I would prefer to discuss the proposition principally from a commercial standpoint in view of the goal already fixed by Congress, namely, a merchant marine sufficient to carry the major portion of our commerce, because this goal balances with the naval and military requirements. And here it might be added from a defense standpoint that the dollars spent in building our merchant marine are equally as important as those spent in maintaining our Army or our Navy.

Thus, we are to have a merchant marine to be privately owned and operated when private operation becomes possible, but meanwhile it is to be operated by the government. With the moral assurance that Congress will continue to supply the necessary funds wherewith to carry out this policy above stated, our program is complete and adequate and ultimate accomplishment is made certain.

No real American familiar with the facts would dare even to suggest a turn-back policy. To confuse the proposition is no longer an easy matter to those who would seek to confuse it. They do, however, employ very ingenious methods against which the people should be warned. For instance, this sort of fellow in order to gain confidence and distract attention will approach his victims with laudatory and patriotic phrases in expounding the advantages of a merchant marine. He will tell you that we must have a grand glorious merchant marine, then he tells you we can only have it through private operation and that the government must get out of the shipping business, that private capital cannot operate unless we have a ship subsidy, but that we cannot get a subsidy. The net result of what he has said is that America must abandon the sea.

Nor have I any sympathy with those who continually talk about the feasibility of an American merchant marine. To be sure if we expect to dance we must pay the fiddler, but the proposition is as simple as when one decides to buy an automobile. He must pay for it. The cost of our merchant marine is insignificant as compared to the benefits to be derived. That may or may not be true in the purchase of an automobile.

U. S. S. "Concord" at Port Soudan

But our merchant marine in reality has become an accomplished fact. We are now looking to ways and means for its further development. It is lamentably true, however,. that we are today carrying in American vessels less than thirty-five per cent of our foreign commerce instead of the major portion as mandated by Congress, but this figure of thirty-five per cent speaks for itself when contrasted with the figure of less than ten per cent which was the percentage carried in American ships before the recent World War.

We have established through the Shipping Board American ship lines for every trade route on which an appreciable quantity of American commerce moves. A few of these lines have been sold to private American capital for guaranteed operation, but the bulk of them operating today are of necessity maintained under the direction of the Shipping Board. We need additional services and improved facilities, but the fulfillment of these needs will come with the continued support of the people.

It seems useless to talk further about a subsidy for shipping in this country. The people are content to have the government operate the necessary fleet to insure commercial protection and military security *so long as private capital does not undertake it.* I would rather see private American capital operate every one of our ships in preference to government operation when that becomes possible, but I should infinitely prefer government operation as against foreign domination or in preference to no operation at all.

I believe that as we in the United States continue to gain efficiency in ship operation through experience, the transfer of our merchant ships to private hands will become more and more possible. We cannot expect in so short a time to be able to compete with long established foreign lines when we have remained a dormant figure in shipping for so many years. Shipping has become a matter of competition between nation and nation.

Production in this country has always been larger than our consumption. We have been content for many years to remain at the mercy of foreign ships in the carrying of our excess products, but in the world markets today, through Shipping Board vessels, we have a voice in fixing rates which protect the farmer and the manufacturer and the people at large. In fact, ocean freight rates are practically where they were before the War due entirely to this fact. We must continue to produce surplusses,

not only in agricultural pursuits but in manufactured articles. Favorable ocean transportation must, therefore, be maintained to accommodate the transportation of this surplus.

It has not been so very many years since some of our own people ridiculed the idea of an American Navy. They considered it extravagance and said that we had no need for a Navy. Today our Navy is recognized as being second to none in the world, and this is because every American has long ago become educated to the necessity of a Navy. The same thing is taking place with respect to our merchant marine, but we must keep on educating. The Navy and the merchant marine should have been progressing hand in hand all the while.

When we entered the war in 1917 we had to pay Great Britain and other allied nations to transport our troops and supplies at an enormous cost. We had everything that was needed to get to our coast line, but we could not go beyond. We also needed American ships to carry our goods to foreign markets. An immediate result of shortage of tonnage is an advance in ocean freight rates. We had to pay whatever the foreign ship owner asked. Twenty-five years ago during the Boer War the same thing happened in lesser degree. An American merchant marine would have acted as a curb against foreign owners exacting extortionate rates. In 1916 the Act of Congress decreed a merchant marine, and a great fleet of ships were built primarily for war purposes at a cost of billions of dollars. The war had terminated before these ships could serve that purpose except indirectly. We were now in a position to move a great portion of our products. The demand for American goods at the close of the war and for years following was enormous. We had practically to supply Europe—allies and enemies alike—until they could regain their footing. The Shipping Board rushed its vessels fresh from the builder into the commercial service. For the first time in fifty years American ships in large numbers were sailing the ocean as peaceful commerce carriers. We were no longer relying on foreign ships, and as a result the freight rates were halted in their upward movement, became tempered and stabilized and then gradually receded. The American merchant marine had saved the situation for the United States. It was present at the moment when the demand for American goods was greatest, and it made possible shipment of billions of dollars' worth of American products because these rates were cut down to a point that allowed the foreign countries to purchase.

The prosperity in the United States following the war's close was caused in large measure by this demand for American products.

The American merchant marine provides means of training a naval reserve corps. In 1914 when Great Britain entered the war, she was able to call thousands of men to the colors—trained seamen ready to join fighting ships or transports under naval orders and discipline at a moment's notice. This was made possible only by the existence of a large merchant marine. France, Italy, Germany, and other maritime nations also had their naval reserves through their merchant marines. In what a vastly different situation we found ourselves! We had no naval reserve at all, and when we built these ships to carry cargoes we were faced with the difficulty of manning them. We had to take many captains and officers who were foreigners and not yet naturalized, holding the temporary and so-called "red ink" licenses, and among the unlicensed personnel many were not only foreigners but had never before been to sea. We had no alternative. We are now endeavoring to prevent a possible repetition of such a situation.,

The Congress by its Act of 1916 established the United States Shipping Board for the purpose of encouraging, developing and creating a naval auxiliary and naval reserve and a merchant marine to meet the requirements of the commerce of the United States, and by its Act of 1920 declared it to be the policy of the United States to do whatever may be necessary to develop and encourage the maintenance of such merchant marine. The carrying out of the purposes of Congress was to be the job of the Shipping Board. The Board established trade routes on the Atlantic, Gulf, and Pacific coasts to important foreign countries as follows:

North Atlantic to—	Gulf to—	Pacific Coast to—
United Kingdom	East Coast of South America (Brazil, Uruguay and Argentina)	Far East
France	United Kingdom	Australia
Germany	French Atlantic ports, Belgium (Antwerp), Holland (Rotterdam), Germany (Hamburg and Bremen)	East Coast of South America
Holland	Western Mediterranean (Spain and Portugal)	Orient
Belgium	Mediterranean ports east of and including Genoa	
A small part of Scandinavia	Far East	
Mediterranean, including Italy, Greece, Turkey, Egypt, and northern African ports		
West Africa		
South and East Africa		
India		
Australia		
Far East and Dutch East India		
South America		
West Indies		

There were about 2,000 ships built. They were of different sizes and construction. They were examined, segregated—those necessary for trade routes, those in good condition for operation and those fit only for scrap. All the ships have been offered for sale to private interests for operation. Of course, the Shipping Board has been forced to reduce here and there its operations due to reduced appropriations by Congress to meet the attendant losses which were necessary as a cost of maintaining our merchant marine in the same manner as there is a cost incident to the maintaining of the Army or the Navy.

Congress in amending the Merchant Marine Act has provided that part of the Shipping Board construction loan fund may be used to install Diesel type electric drive engines in a number of government owned merchant vessels and the Shipping Board is going forward with the work.

Section eleven of the Merchant Marine Act originally provided for a "construction loan fund," derived from the proceeds of sales and liquidation of Shipping Board plants, vessels and surplus materials, at the rate of $25,000,000 per year up to a maximum of $125,000,000 to be loaned at nominal rates to nationals for the construction in domestic shipyards of vessels equipped with the most modern and efficient machinery and appliances. As now amended this section will also permit lending one-half the cost of equipping vessels already built with the same kind of machinery, which in reality means internal combustion engines and electric driven auxiliaries.

Under this section approximately $67,000,000 has been accumulated; and section twelve, as now amended, allots $25,000,000 of this fund to the Shipping Board for a similar rehabilitation of its own vessels.

About 375 vessels were selected as most suitable for a rejuvenation of their machinery with modern Diesel propelling power. This class offers a wide range of types and sizes and includes well preserved hulls of good design but fitted with machinery requiring extensive alterations in varying degree. Its replacement with improved steam machinery would undoubtedly enhance reliability and also economy to a lesser extent, but the resultant benefits would be quite incommensurate to the cost involved, and as these vessels are not marketable in their present condition, they might be doomed to ultimate decay.

Once, however, their motive power is replaced with modern and reliable Diesel machinery, they should prove competitive and valuable additions to the American merchant marine. Admittedly the cost will be high, but it should be remembered that a motor ship generally consumes, when at sea, but one-third and when in port but one-tenth of the fuel burned by a sister steamship of equivalent power. This saving in fuel, plus that accruing from reduced engine room personnel, and consequent reduction in wages and subsistence, has been found in practice to absorb the cost of conversion in a period of from six to seven years. If the greater potential earning power of the converted vessels, by reason of their enhanced cargo carrying capacity, is taken into account, this time would be accordingly reduced.

As regards the fund of $25,000,000 rendered available for conversion of the board's own steamers, it should be noted that its judicious expenditure over a period of years should effect the conversion of about sixty large vessels aggregating approximately 600,000 deadweight tons. These units will not only provide much needed replacements, but will also prove formidable competitors for the eventual expansion of our trade.

As the first step towards the consummation of such a comprehensive program the board has tentatively selected twelve vessels of the 8,800 and 9,400 d.w.t. type to be propelled by a single engine of approximately 2,600 shaft horsepower in order to obtain an average service speed of eleven knots, fully loaded, which is considered the minimum speed desirable in view of the forthcoming competition from the faster and newer foreign motorships. As soon as completed, these vessels are to be actively engaged on the essential long-distance routes. The introduction of motorships in such trades should more readily develop them into desirable and remunerative ventures, and make possible their eventual absorption by private capital; in the interim the board would effect substantial savings in operations.

This policy should greatly assist the development and establishment of the related industries for as soon as standardized sizes are manufactured in greater number lower production costs will necessarily follow. This should further stimulate the conversion of the board's vessels by private capital under the construction loan policy as well as the construction of motorships of greater speed

and special types, which are not to be found in the board's tonnage, built to a comparatively narrow range of sizes and speed.

The combined effect of this new legislation and the board's policy of selling Diesel hulls at nominal prices, as well as the stimulus of the board's well correlated program, should enable private interests to convert these steamers into efficient motorships at somewhat lower cost than equivalent foreign tonnage. No better notice could be served that the American flag is to permanently fly on the seven seas.

It has taken many years for the merchant marine to arrive at the position in the popular mind which it occupies today. In an address in New York at the Fellowcraft Club, April 29, 1891, Commodore William H. T. Hughes said:

> England then [after the Civil War] made one of the most paying investments ever made by any nation. She fitted out a few privateers, destroyed the American merchant marine, and in 1872 she paid us $15,500,000 for the fun she had had, and the whole press of the country sounded the praises of the commissioners we sent before the arbitration court, and announced to the world that we had our revenge, had twisted the Lion's tail, and that England had learned the truth of the old adage, "You cannot dance without paying the fiddler." Have any of us ever considered what amount of interest we have paid England on that $15,500,000? Gentlemen, we have been paying at the rate of about $100,000,000 to $125,000,000 a year in freight and passage money as interest on that investment, and unless we do something to build up a merchant marine again, and take the place among maritime nations which belongs to us, we shall continue year by year increasing the rate of interest.

At the beginning of the World War, when the folly of our dependence upon foreign shipping for the marketing of our goods became so painfully apparent, President Woodrow Wilson said:

> We have grossly erred in the way we have stunted and hindered the development of our merchant marine. And now when we need ships, we have not got them. How are we to carry our goods to the empty markets of the world if we have not the ships? How are we to build up a great trade if we have not the certain and constant means of transportation upon which all profitable and useful commerce depends? And how are we to get the ships if we wait for the trade to develop without them? To correct the many mistakes by which we have discouraged and all but destroyed the merchant marine of the country, to retrace the steps by which we have, it seems, almost deliberately withdrawn our flag from the seas would take a long time and involve many detailed items of legislation and the trade we ought immediately to handle would disappear or find other channels while we debated the items.

Presidents since that time have stood for a real merchant marine.

Commodore Hughes in the same speech in 1891 further said:

At the head of one of the great staircases in the Capitol at Washington is a painting showing the pioneer winding his way to open up the western country, and beneath it we read:

"No pent-up Utica contracts our powers,
But the whole Continent is ours."

May we some day see at the head of another staircase in that building a picture of equal dimensions which shall depict the American steamship ploughing every sea, and beneath it we shall write:

"No pent-up lakes or harbors confine our maritime powers,
The oceans and commerce of the whole wide world are ours."

What Commodore Hughes hoped for at that time has at last come true.

THE MEDICAL DEPARTMENT OF THE NAVY

By Rear Admiral Edward R. Stitt (M.C.), U. S. Navy,
Surgeon General of the Navy

STRATEGIC plans are based on the assumption that the personnel is physically fit. It is taken for granted that the operating personnel for big gun ships, submarines, aircraft, and expeditionary forces meet the exacting physical requirements for each peculiar type of duty. Bases are planned and lines of communications projected to fit military considerations quite apart from the possibility that they may seriously menace the health of the personnel and influence the outcome of the campaign.

It is believed that the medical department should be so organized and administered that strategists may feel confident that every effort has been made to select men physically fit and to help keep them fit and that detailed plans for the care and evacuation of sick and wounded have been formulated.

The medical department cannot always combat disabling morbidity conditions native to localities. Many a campaign would have been planned differently had the possibility of infection and epidemic been foreseen by strategists. After all, biology rules the world. A disease-bearing mosquito defied the attempt of Count DeLesseps to sever the Americas. The destiny of nations may yet be decided by the mosquito, the fly or the rat.

Modern inventions and rapid transportation have made the world a neighborhood. No longer is isolation of a country possible. Political upheavals have so altered world politics that shrewd students disregard traditional potential enmities and see possibility of conflict where none existed before. It is more than ever necessary that the members of the naval medical department should have a thorough knowledge of the prevention and care of diseases encountered in all parts of the world, particularly tropical diseases.

Fortunately the medical department of the Navy has had valuable experience in the prevention and treatment of tropical diseases on a large scale. At the present time our medical officers are

directly concerned with the health of some 2,700,000 people in widely separated parts of the world. The Navy and Marine Corps constitute only 119,000 of this total. Before the withdrawal of our forces from the Dominican Republic, supervision over the care and treatment of 3,500,000 of people devolved on the medical personnel of the Navy.

In the West Indies, Navy personnel are responsible for the public health of the Virgin Islands and Haiti, both of which have assumed greater importance from an epidemiological point of view with the increased traffic through the Panama Canal.

To make sanitary a country formerly as neglected as Haiti requires years of unremitting effort. Sanitary engineering methods and intensive treatment must be combined in order to overcome the neglect of centuries. The medical forces must search out a number of variously infected carriers with a view to the limitation of further and continued infection.

Haiti, with its 2,500,000 of backward people scattered over an area of 10,200 square miles, has offered a somewhat difficult problem in public health. Malignant malaria, elephantiasis, small pox, syphilis, dysentery, typhoid, and dengue are among the diseases requiring special attention.

The medical officers of the Navy serving with Service d'Hygiene in Haiti while laboring unselfishly for the native population are, incidentally, making a contribution to national security and international health. In 1920 smallpox spread over almost the entire island. It has been estimated that about sixty per cent of the Haitian population were infected. The epidemic impressed upon the hitherto unconvinced Haitians the necessity for vaccination and almost 900,000 of the population were vaccinated by naval medical officers and members of the hospital corps of the Navy.

Since 1915, Service d'Hygiene has been instrumental in gradually establishing hospitals and clinics for free treatment.

Education is, perhaps, the most enduring influence for sanitation. Before the American Red Cross took over this work, members of the Navy nurse corps supervised a training school for native nurses. Haitian physicians have been instructed in public health work and encouraged to serve in Service d'Hygiene. Our medical officers and nurses have been effective in teaching prenatal care and in the reduction of infant mortality. Most important of

all, the population is beginning to realize that preventive medicine is more potent than voodooism.

In the Virgin Islands it has been the Navy's privilege to improve health conditions. Typhoid fever, formerly common, has disappeared. This was brought about by proper attention to the milk supply and disposal of waste. The anti-typhoid vaccination of all between the ages of five and forty-five has practically conferred immunity on the whole population. Venereal diseases which have been notoriously rampant in these islands have been given vigorous attention. Amid foods and fruits abounding in vitamines the inhabitants fell prey to pellagra. Hospitalization of those affected and instruction in proper feeding have caused pellagra to disappear.

Baby clinics are conducted all over the islands and members of the Navy nurse corps have contributed to the reduction of the high infant mortality rate by training native nurses who in turn give instruction in prenatal care and in the proper care of infants. This country is probably the only one in the world which keeps a health record for each inhabitant.

In Guam the results in improved health conditions have amply repaid the Navy for its efforts in prevention and treatment of such diseases as leprosy, yaws, gangosa, and various skin diseases. At the time Guam was taken by the United States, the natives were suffering from a severe epidemic of typhoid fever. Corrective sanitary measures speedily terminated the epidemic and this disease has practically been unknown in Guam since.

Gangosa, so named by the Spaniards in allusion to the muffled voice noted in some of the victims, was the scourge of Guam. It is a horribly mutilating disease which often destroys the features of the face. During the ulcerative stage the patients are malodorous and very objectionable. The naval medical officers have practically eradicated this disease through the extensive use of salvarsan preparations.

When compulsory vaccination against smallpox was first attempted the inhabitants of Guam did not take kindly to it. The Governor, a line officer of the Navy, thereupon arranged to be vaccinated on his porch in full view of the curious populace. For several days thereafter he traveled about proudly exposing the dressing on his arm. The natives eager to be in style, hastened to follow his example.

In American Samoa the responsibility for sanitation entails an international health obligation. Pago-pago, with one of the finest harbors among the thousand islands in the Pacific, is a port of call for steamers from all parts of the world. It is imperative that it shall not become a focus for the spread of world-wide infection. Sanitary conditions are now very satisfactory.

Elephantiasis was formerly very prevalent in Samoa. This disease is carried by a mosquito. Its name is the Greek equivalent for "elephant disease" and picturesquely refers to the fact that the limbs and genitalia assume elephant-like proportions. It may be of interest to note that a naval medical officer had remarkable success in operating on scrotal elephantiasis on a large scale. In 1906 he performed 149 such operations with complete success. When it is realized that the masses removed weighed from ten to eighty-five pounds, one will understand what a relief from their pitiable conditions the patients experienced.

It is believed that strategists should avail themselves of the knowledge of morbidity conditions gained by the medical department. The planning division of the Bureau of Medicine and Surgery conducted a careful study of the sanitary conditions of the various countries and islands which are involved in possible campaigns. Such knowledge should be utilized not only to safeguard the armed personnel but to protect the population of the homeland against infection from returning troops. It is well established that leprosy was introduced into Europe, from Egypt, in the first century, B. C., by the returning legions of Pompey. As a result of the Crusades, leprosy was spread widely over Europe by the crusaders, so that in the fourteenth century the disease was so prevalent, that it required approximately 20,000 leper asylums to care for the lepers. Venereal diseases follow in the wake of armies. Plague, typhus, and cholera might readily be introduced from the Orient. Fortunately, most of the disabling diseases are preventable when there is proper cooperation between the military and medical departments, a condition that happily obtains in the naval service.

The Bureau of Medicine and Surgery is divided into a number of divisions which combine the efforts to obtain physically fit personnel, promote health measures, administer facilities for the care of the sick, and prepare plans for medical department preparedness.

The division of finance prepares medical department estimates for the budget, allots funds for the operation of each medical department activity afloat and ashore within the limits of available appropriations, audits the returns of these activities, accounts for medical department appropriations and property, and attends to matters of medical supply.

The Navy's health is carefully watched by the division of preventive medicine. This division keeps informed of conditions prevailing throughout the service by means of reports and statistics. Epidemiological conditions in various parts of the world are taken into account for their possible effect on our widely distributed personnel. A monthly index of health conditions, as reflected in reports from ships and stations, is circularized for the information of the fleet and shore establishment. One section of the *U. S. Naval Medical Bulletin,* a publication for the information of the medical department, is reserved to this division for the timely dissemination of observations for the improvement of health conditions and prevention of accidents.

Physical standards for enlistment, for commissions in the Navy, and entrance to the Naval Academy, as well as special physical requirements for submarine and aviation personnel, are considered by the division of physical requirements and medical records. Medico-legal matters relating to enlistments, surveys, discharges, deaths, pensions, physical fitness for promotion, etc., are cared for by this division which also reviews examination reports submitted by some fifty-two medical officers stationed at navy and marine recruiting stations.

The personnel division arranges for the distribution of the personnel of the medical corps, hospital corps, and nurse corps and provides for courses of instruction to fit them for general and special duty.

Routine administration of the bureau, correspondence, civilian personnel, public works projects for the medical department and provisions for the care of the dead are matters under the cognizance of the administrative division.

The division of planning and publications prepares contributory material and personnel plans and supervises research for safeguarding personnel and improving medical supplies and equipment. Officers of this division serve with officers of the medical department of the Army on medical subcommittees of the Joint Army

and Navy Munitions Board and technical committees of the Federal Specifications Board. The *United States Naval Medical Bulletin* and the *Hospital Corps Quarterly* are edited by this division.

Details relating to duties and instruction of the dental corps are supervised by the division of dentistry.

The division of hospitals and inspections inspects all medical activities of the shore establishment. Particular attention is paid to the care received by patients of the Navy, Veterans' Bureau and Employees Compensation Commission at naval hospitals and dispensaries. Suggested improvements for hospitals are passed on by this division whose officers have gained familiarity with local conditions through inspections.

The Bureau of Medicine and Surgery provides medical equipment and personnel for some 270 vessels of all types scattered over the China, Caribbean, and Mediterranean Seas and the Pacific and Atlantic Oceans.

The battleships and parent ships for submarines and destroyers have on board miniature hospitals called sick bays, comprising a dispensary or pharmacy, operating room, sick ward, dental operating room, isolation ward, and related utilities. On some ships laboratory and x-ray equipment is provided.

While the sick receive every needed attention on our combatant ships, it is not considered desirable to keep sick men on a fighting ship for any length of time. They need to get away from the noise and activity of a busy ship.

Two hospital ships with a combined capacity of 900 beds are available for the sick of the fleet. These sea-going hospitals accompany the fleet and are as completely equipped and afford as specialized treatment as the hospitals in our large cities. Each of the hospital ships carries a group of specialists and a staff of Navy nurses and hospital corpsmen.

The naval shore establishments exist solely for the support of the fleet. Medical facilities are a necessary part of the fourteen naval districts through which the shore establishment is at present administered.

The medical department of the Navy operates nineteen hospitals with a combined capacity of 7,340 beds and capable of considerable expansion without overcrowding. To meet unusual demands, the hospitals can quickly be expanded by the construction of standard building units planned for emergency use.

Our naval hospitals are located at ports along the Atlantic and Pacific Coasts, at Great Lakes, on the Gulf, and at Guam, Pearl Harbor, T. H., and Canacao, Philippine Islands. Most of them are situated in beautiful parks which afford quiet and relaxation for the patients.

Medical supply depots at Brooklyn, New York; Mare Island, California, and Canacao, Philippine Islands, provide medical equipment for the fleet and shore establisment.

The main medical supply depot in Brooklyn, has well equipped chemical, physical, bacteriological, and electrical laboratories. Here instruments, x-ray equipment, textiles, dressings and other medical supplies are tested. Drugs and chemicals are analyzed to determine purity. Suture material intended for naval patients is tested before acceptance to insure that the surgeon may rely on its strength and sterility. Clinical intruments of precision are calibrated to determine if they accurately measure temperature, blood pressure or the number of blood corpuscles, as the case may be. This supply depot also tests material purchased for the Veterans' Bureau.

In order to foster efficiency, members of the four corps of the medical department—the medical corps, dental corps, hospital corps and nurse corps—are afforded opportunities for special training.

A naval medical officer may be on a ship a thousand, or more, miles from a hospital. An emergency may arise requiring immediate operation. It may be an acute abdominal condition or, again, it may be a mastoid infection. Circumstances like these require that every medical officer shall be a surgeon as well as a general practitioner. Special knowledge is also necessary if the medical officer is to be a successful sea-going sanitarian.

The Naval Medical School in Washington prepares the young medical officer to meet these service requirements. He is also given instruction in submarine hygiene, aviation medicine, and defensive measures in gas warfare. The student is finally given ground work in medical tactics and field sanitation under field conditions with the medical battalion attached to the marine barracks at Quantico, Virginia.

After a tour of duty afloat, the medical officer is returned to the school for further instruction. After eight or ten years' service he may elect a speciality and receive a course therein at one

of the leading medical schools at government expense. He will continue work in his chosen speciality until he reaches administrative rank.

Experienced medical officers who are to serve in important administrative positions and in connection with the planning activities of the Bureau of Medicine and Surgery are ordered to the Naval War College where they take the course prescribed for line officers. This training has been extremely valuable for fleet surgeons, district medical officers, and officers engaged in formulating medical preparedness plans.

Naval medical personnel serving with marines receive special training. The medical officer of a medical battalion or medical regiment must understand military tactics, map reading, etc., and be prepared to move and dispose the medical units in accordance with the plans of the force commander. Medical officers selected for force and regimental surgeons are trained at the Medical Field Service School of the Army.

In addition to specialities known in civil life, the Navy has need of special qualifications, notably in submarine hygiene, aviation medicine, deep sea diving, and chemical warfare.

Graduates of standard medical schools may now serve their interne-ship in naval hospitals. While so serving they hold the rank, and receive the pay and allowances, of lieutenant (j.g.). As the Navy has only male patients in its hospitals, the internes are given training in obstetrics and in diseases of women and children at civil hospitals in order to qualify for the general practice of medicine. Those returning to civil life are being enrolled in the Naval Volunteer Reserve.

The volunteer reserve should have a special appeal to medical men who wish to serve their country in time of war. They may enroll for service at sea, or with the marines, or at station and base hospitals.

Specialists are being enrolled for service with a "station hospital group" to be organized by commandants of naval districts, or for service with "hospital ship group" or " base hospital group" to be organized by the Navy Department. Associated specialists may arrange for such a group.

Members of the dental corps serve as part of the medical department on ships at shore stations and with the marines. The Naval Dental School is maintained in conjunction with the Naval

Medical School at Washington to afford special training to dental officers in view of the close relationship of medicine and dentistry. At the school members of the hospital corps are trained by dental officers to become dental technicians in order to extend dental service to officers and men who might otherwise be left without proper measures for the care of their teeth. The officers of the dental corps have been somewhat handicapped in their efforts to extend dental facilities by reason of the fact that only one dental officer is allowed for each 1,000 men.

On combatant ships, as well as on the hospital ships and at shore stations, the men of the hospital corps assist the medical officer in caring for the sick. Leading petty officers of this corps care for emergencies on board small vessels which do not justify the full-time services of a medical officer. The hospital corps is composed of a fine type of men who have in the past reflected great credit on the Navy. A number of them served with distinction as part of the marine corps forces in France.

Hospital corps training schools are maintained at Portsmouth, Virginia, and at Mare Island, California. Special instruction is offered to hospital corpsmen in laboratory and x-ray technique, embalming, physiotherapy, and operation of electro-cardigraph apparatus.

The chief pharmacists and pharmacists of the Navy constitute the officer personnel of the hospital corps and are employed in administrative and technical capacities in the medical department. A number of these officers have specialized knowledge in chemistry, bacteriology, accounting and business administration, x-ray, and law relating to medico-legal matters, while others have availed themselves of courses of instruction offered by the Navy.

The nurse corps of the Navy is composed of women who are graduates of recognized schools of nursing. Its members have added to their professional ability through special instruction in laboratory technique, dietetics, and special phases of nursing. The privilege of retirement has recently been granted to this deserving corps of loyal women and it is hoped that women of high standard may more than ever feel encouraged to follow a nursing career in the Navy.

As part of the Navy, the medical department exists for peace but must be prepared for war. This necessitates preparedness of personnel and equipment. In addition to the care of the navy

and marine corps personnel, the medical department of the Navy is responsible in an overseas campaign for the sanitation of troops while on board ship and the evacuation and care of sick and wounded on transports and hospital ships.

The magnitude of the task was shown in the World War when the Navy carried to Europe some 900,000 troops and brought back in the neighborhood of 2,000,000. Between May, 1917, and November 11, 1918, 159,670 sick and wounded were returned to the United States by the United States Navy cruiser and transport service and hospital ships.

In a campaign where the lines of communications are longer and not so many bases available as in the World War, the task would be still greater. The late war has shown that the peace-time medical personnel is only a nucleus but it must be efficient and capable of rapid expansion.

THE MARINE CORPS, 1926

By Major General John A. Lejeune, U. S. Marine Corps
Major General Commandant

IN SETTING forth the present duties and organization of the Marine Corps, it will simplify matters if I first state its mission. The mission of the Marine Corps is not new, but has remained, to all intents and purposes, the same in the century and a half of its existence. It may be expressed briefly, as follows:

To support the United States fleet and to aid the Navy in carrying out that part of the policy of the government which has been or may be assigned to it.

The Marine Corps or any part of it may, however, by direction of the President, be assigned to duty with the Army. The most notable example of such detached service was, of course, the duty of the marine brigade with the American Expeditionary Force in France during the World War. Other instances have been service at Vera Cruz, Mexico, in 1914, and with the Army of Cuban Pacification, 1900-08.

Nevertheless, the normal duties of the Marine Corps are with the Navy, in pursuance of the mission as outlined above. These duties may be classified as follows:

(a) Detachments to guard and protect navy yards, naval bases, and other naval utilities, at home and abroad.

(b) Guards for American legations in foreign countries, such guards being under the jurisdiction of the flag officer in command of the naval forces on the station.

(c) Landing forces to protect American lives, rights, and interests.

(d) Forces of occupation to restore order and to maintain peace and tranquility in disturbed countries, as, for instance, Haiti, and the Dominican Republic.

(e) Detachments for marine corps administrative purposes, such as the recruiting service, training stations, supply depots, etc.

(f) Marine detachments for service on board the vessels of the fleet.

(g) Expeditionary forces for service with the fleet in war.

It is my intention to discuss here, only the last two types of duty, since they are, in a very special sense, marine work and are the real justification for the continued existence of the Marine Corps.

Duty aboard the vessels of the United States Navy is the oldest duty the Marine Corps performs. In fact, it is the service which originally brought about a Marine Corps. Since the United States has had a Navy, marines have served aboard naval vessels composing it. Originally the purpose of having marine guards aboard naval vessels was two-fold: to have aboard a body of trained soldiers who were available to carry out operations on shore should landings be necessary, and also to deliver an accurate musketry fire in naval engagements, fought, as they were in those days, at very close ranges. Also a marine guard was considered necessary on every naval vessel of any size to maintain order and discipline, the seamen personnel in those days frequently being foreign born and more or less unreliable. Marine detachments were usually quartered just forward of the ward-room, a custom which still exists on some ships, though the reason for it has long since disappeared.

Many changes have, of course, occurred since those days. A military guard is no longer required for the enforcement of discipline aboard American men-of-war. Naval battles are now fought at ranges which completely preclude the use of musketry. It is still necessary, however, to have aboard ship a detachment with military training and equipment which can act as the nucleus for landing forces. All battleships as well as most of our cruisers, therefore, still have marine detachments. In some of our naval units, such as the special service squadron, the marine detachments number almost twenty per cent of the whole ship's company.

Landings of armed forces from naval vessels in foreign countries for the purpose of protecting American interests are by no means things of the past. Such landings occurred in Central America in 1924 and in China last year. It was found necessary on the Asiatic station to provide small temporary marine detach-

ments even for some of our destroyers operating off the Chinese coast.

It must not be thought that marines aboard naval vessels are merely military passengers, useful only when landing operations are necessary. On the contrary, they carry out very essential functions aboard ship. The duty that distinguishes them from the seamen personnel is the manning of all the sentry and orderly posts and furnishing guards of honor on ceremonial occasions. Marine detachments, in addition, perform the regular duties of a combatant division of the ship's company. They man part of the ship's battery. Their officers frequently form part of the fire control party of the ship and the detachment takes part in the usual athletic and sporting activities aboard.

Marine detachments aboard ship are differentiated, not only in their duties and training, but in their equipment, from the remainder of the ship's company. Every detachment, for example, carries cots, cooking stoves and other landing equipment. In fact, the presence of marines aboard ship means that the commanding officer of the vessel has a force completely equipped to land and remain ashore indefinitely.

As a matter of fact, there is no duty which is of greater importance to the Marine Corps than service afloat, for the personnel engaged in it, after completing their cruises are assigned to shore duty and thereby form a nucleus of men trained to seagoing life, invaluable on any expedition involving ship to shore duty. The question of sea duty applied to the Marine Corps really resolves itself down to the reason for the existence of the corps. The average civilian, perhaps, if he thinks at all on the subject, can see no reason why there should be one military body, the Army, attached to the War Department, and another military body, the Marine Corps, trained and organized in many respects in a similar manner, attached to the Navy Department. The reason is, of course, in those features of training and organization which are not identical in the Army and Marine Corps.

There are two major ends toward which the organization, equipment, and training of the Marine Corps are directed; first, ability of personnel to serve efficiently both on ship and on shore and in operations from ship to shore; second, immediate readiness for overseas service, normally with the fleet.

The accomplishment of these purposes, of course, is essential to carry out the last and most important type of duty listed above, expeditionary forces for service with the fleet in war. This duty is the fulfillment of the primary war mission of the Marine Corps, which may be said to be, to support the fleet by supplying it with a highly trained, fully equipped expeditionary force for the land operations necessary for the effective prosecution by the fleet of its major mission, the control of the sea.

An overseas campaign has two distinct phases; first, the naval phase, in which the operations of the fleet have as their objective the attainment of the control of the sea in the theater of operations; second, the military phase, in which the Army has as its objective the invasion and occupation of the territory of the enemy. It is during the first or naval phase that the Marine Corps expeditionary force would be constantly engaged in the prosecution of its naval war mission. Its field of activity would be the many minor shore operations which are necessary for the speedy success of the fleet's campaign to gain control of the sea. During the second phase, only a small part of the expeditionary force would probably be required for service with the fleet and the remainder would be available for service with the Army and should be so utilized. In war there can be no sound reason for a failure to use every resource which is at hand.

The writer was a member of the special board appointed by the Secretary for the purpose of investigating the effect of the development of aviation with reference to the development and upkeep of the Navy in its various branches. That section of the report of this board concerning advanced bases and marine corps expeditionary forces sets forth so clearly the function of the Marine Corps in a major naval campaign and the measures adopted by the corps to carry out the task involved, that I will quote it in part:

243. The mission of the Marine Corps, as a part of the Navy is as follows:

To support the fleet, or any part thereof, in the accomplishment of its mission.

244. The mission is derived from the statement of the general naval policy regarding the Marine Corps, contained in the approved United States naval policy dated December 1, 1922, which reads as follows:

"To maintain a Marine Corps of such strength that it will be able to adequately support the Navy by furnishing detachments to vessels of the

fleet in full commission, guards for shore stations, garrisons for outlying positions; and by the maintenance of an expeditionary force."

245. The Marine Corps has been indoctrinated with the naval sea idea by having certain of its personnel serve as a part of the crews of the ships of the fleet, and by expeditionary service in naval transports, and also by keeping alive a traditional interest in all naval affairs. This has been accomplished in part by supplying a part of its commissioned personnel from graduates of the Naval Academy.

246. The naval advanced base idea has been developed from the necessity for temporary bases within the theaters of possible naval operations from which the fleet can operate against the enemy fleet unhampered by a large train and to which the fighting ships can go to refuel, revictual, effect repairs, and, especially in the case of smaller craft, such as destroyers and submarines, obtain necessary rest and recuperation for the crews, during the course of the naval campaign on the high seas at a distance from the home navy yards and bases. The establishment and maintenance of the shore forces of such naval advance bases is a wartime function of the Marine Corps, and it requires that forces be organized, equipped, and trained, ready to meet the contingency when it shall arise. Furthermore, the forces organized and trained for this mission must be ready to move with the fleet whenever the latter leaves its home base for war-time service overseas.

247. While the seizure and defense of the advanced bases necessary for the fleet in its campaigns overseas is a primary function of the organized Marine Corps expeditionary forces, it may become necessary, especially at the beginning of a naval campaign, to capture enemy bases or to deny to the enemy suitable sites for the location of such bases, and the expeditionary forces must be organized, equipped, and trained with this purpose also in view.

248. The seizure and defense of naval advanced bases will normally occur during major operations of the fleet in extensive war-time operations, but there are other classes of expeditionary service which the Marine Corps may be called upon to perform under its mission. These will include certain minor operations necessary to enable the fleet to carry out its mission. Historical incidents of this particular class of duty include the operations at Mobile Bay and the mouth of the Mississippi River and Fort Fisher during the Civil War, and the occupation of the city of Manila after the battle of Manila Bay during the Spanish-American War.

249. Briefly summarized, the mission of the Marine Corps requires:

(a) That Marine Corps expeditionary forces be maintained at two bases, one on the east coast and one on the west coast, which must be organized, equipped, and trained as expeditionary forces to accompany the fleet, or any portion therof, whenever required in peace or war; and these forces must have the flexibility which will allow of operations on any scale from a small minor landing operation in peace to the seizure and defense of an advance base for the fleet in a maximum effort of war.

(b) That these Marine Corps expeditionary forces must be so organized as to permit of rapid expansion in time of war or threatened war to the strength estimated in naval war plans as essential to meet the requirements of the fleet in war.

250. The primary mission of the Marine Corps requires that its expeditionary forces shall act as an integral part of the fleet, and its minor missions, or missions in minor operations, require that smaller detachments of Marines shall act as a part of subdivisions of the fleet in peace or war. These requirements demand that the Marine Corps shall be imbued with naval ideas, acquainted with the traditions of the sea service, accustomed to life aboard ships at sea, and consider itself as an important and integral part of the naval service. These conditions can only be met by sea training in the active ships of the fleet of a large part of the personnel of the Marine Corps, and the personnel so trained at sea will then serve to indoctrinate the whole corps with the *esprit* and ideas of the Navy. To this end, it is important that the Marine personnel assigned to duty aboard the active ships of the fleet should be considered and treated as an integral part of the ship's complement, though the service required of marine detachments aboard ships may vary with the nature of the duty which the ship is performing,

257. The board is of the opinion that the Marine Corps should be organized, equipped, and trained in such manner as to best meet the requirements of its mission. This requires the following: (a) Service of a portion of the marine personnel as an integral part of the crews of the active ships of the fleet to indoctrinate the whole corps with naval ideas and customs and duties. (b) The organization and training of two Marine Corps expeditionary forces in readiness for the various classes of naval expeditionary duty in the Atlantic or the Pacific, with provision for the rapid increase of such forces to the required war strength when war becomes imminent. (c) Frequent exercises and maneuvers of these expeditionary forces with the fleet to accustom them to embarking and disembarking personnel and material and to joint land and sea operations under similated war conditions.

The Marine Corps at present consists of about 1,000 officers and 18,000 enlisted men. The corps has never been organized in the sense that the Army is organized, into permanent divisions, brigades, regiments, and companies. Just before the war however, a number of permanent companies were formed, especially those in the advance base brigade, then stationed at Philadelphia, when in the United States. Numbered regiments were also formed. During the war there were several organized regiments of marines, notably the celebrated fifth and sixth regiments, which formed part of the second division of the American Expeditionary Forces. Since the war, the strength of the corps has been greatly reduced and at present the organized units of the corps are largely confined

to those composing the brigade occupying Haiti and the two expeditionary forces.

Before describing the existing expeditionary forces it should be understood that their function in case of war involving a major effort of our fleet is to serve as nucleii around which a much larger expeditionary force can be built. Such a war would, of course, involve a maximum effort of the whole Marine Corps, including the Marine Corps Reserve.

The East Coast Expeditionary Force is stationed at Quantico, with the exception of one battalion of the fifth regiment which is in camp at Guantanamo Bay. It consists at present of, roughly, 3,000 officers and men. In former days marine expeditionary forces consisted entirely of infantry but the service now expected of the corps necessitates many kinds of auxiliary and special troops, though of course, the rifleman is still the backbone of every force. The advances of military science have brought about closer coordination between the various arms. Thus, even as small units as rifle battalions normally have an "accompanying gun" of 75 mm caliber, while a modern force without aviation would be inconceivable. The Quantico Expeditionary Force besides infantry includes an artillery regiment, engineer and signal battalions, gas and anti-aircraft gun companies, as well as a highly trained and well equipped aviation detachment. The artillery comprises guns of two calibers, 155 mm and 75 mm. In addition, there are, of course, the necessary administrative and supply units. Due to the fact that it is more difficult to obtain even partly trained reinforcements for them, the auxiliary and special troops form a larger proportion of the whole than they would in active service.

The training of this force is carried on with strict regard to the principal duty which will be expected of it in case of war. All equipment is designed with the idea of landing from vessels of the fleet, possibly against resistance. "Ship to shore" operations are considered so important that information under that head has been collated into a course which is included in the curriculum of the Field Officers' School at Quantico.

The West Coast Expeditionary Force, stationed at San Diego, California, is organized and trained on similar lines but is much smaller than the Quantico force. The authorized strength of this force is over 1,200 commissioned and enlisted men but at present

its total does not much exceed 800 including aviation. The shortage is due to the fact that the civil war in China has made it necessary to increase the number of marines serving on the Asiatic station.

A word should be said here on marine aviation. Its equipment comprises three types of planes, fighting, observation, and light bombing. In expeditionary service, a part or all of it, depending on the importance of the mission, will be directly attached to the Marine Expeditionary Force. Its commissioned personnel receive their training at Pensacola, alongside of the aviation personnel of the Navy.

Although, as stated above, the expeditionary forces are what might perhaps be called training centers for the duty required of the Marine Corps by its major mission in time of war, the entire corps must also be kept in a state of readiness both as to training and equipment. For the enlisted personnel, training as riflemen is paramount. The marine is primarily an infantryman. The principal weapon of the infantryman is the rifle, although, recent years have seen the adoption of numerous auxiliary weapons. As an organization, the Marine Corps has no superior in rifle shooting. This statement can be proven by referring to the published figures of qualifications as expert riflemen, sharp-shooters, and marksmen of the enlisted personnel of the corps. Small arms target practice is therefore a phase of training that is never omitted, no matter what the emergency may be. Other features of infantry training such as close and extended order, and musketry, are of course included. Musketry, which is really fire control of small arms, is one of the most important branches of military science, and has been greatly developed within recent years. Quantico is the most suitable place to carry out this training.

Marine artillery is trained at Quantico but holds target practice at a nearby army post. Quantico itself has a range suitable for one pounders and light mortars as well as automatic weapons and small arms.

The Marine Corps maintains a very complete system of professional education for its commissioned personnel. There is first, a Basic School, situated at the Marine Barracks, Philadelphia, where all newly commissioned officers, irrespective of the source from which they are obtained, are given a six months' course in the fundamentals of the military art. There is next a

Company Officers' School for the training of junior officers to be company commanders, and finally a Field Officers' School where field officers and senior captains are instructed in the problems of higher command and staff work. In addition to these schools, marine officers frequently attend professional schools of other branches of the service, such as the Army and Navy War Colleges, the Command and General Staff School at Fort Benning, and a number of other army institutions.

The Marine Corps Reserve is now an integral part of the Marine Corps. Its strength at present amounts only to about 250 officers and 2,700 enlisted, but it is hoped to raise these figures eventually to a total of at least 10,000. The reserve act authorizes the assignment to the reserve for a period of four years after his discharge from regular service, of any marine who completes an enlistment, compensation being at the rate of $25.00 per annum. This body of reservists, designated in the *Marine Corps Manual* as Class III, thus provides at little expense a trained group of men ready to return to the colors in time of war or national emergency.

There are, in addition, a few organized companies who drill during the year and receive two weeks' training annually at a marine post. Officers of the Fleet Marine Corps Reserve, not attached to companies also receive each year two weeks' training, usually at Quantico, or San Diego. Like the regular Marine Corps, both the strength of the reserve and the training that can be given its members are limited by the appropriations voted by Congress for the current fiscal year.

The Marine Corps as a whole is now better prepared to carry out its mission than for many years. The intensive program of professional education, which has been carried out consistently since the year 1920, has greatly increased the military attainments of our commissioned personnel. The enlisted force has settled down after the upheaval of the World War and is now well disciplined, well trained, and well equipped. Finally, the part the Marine Corps will be expected to play in the next war, the tasks it will be assigned and the duties it will perform, are clearly set forth, and well understood; it follows, therefore, that our preparation in peace for our duty in war can be, and is more intelligent and more effective than ever before.

THE BUSINESS ORGANIZATION OF THE NAVY

By Rear Admiral Charles Morris, (S.C.), U. S. Navy
Paymaster General of the Navy

WE THINK of the Navy as a highly developed fighting machine, manned by personnel trained to the minute in the operation of its units and in serving its weapons.

We recall with ever increasing pride the glorious deeds of the Navy in aiding to establish the independence of our nation and in upholding and enforcing its untarnished principles throughout its 150 years of life. And we feel today a sense of security in the knowledge that our Navy leads in the modern developments that make for the highest battle efficiency.

It has probably not occurred to many that these developments have largely been conceived by individuals within the Navy itself. Nor is it probable that many realize that in order to finance these developments, to operate, maintain, and man the completed ships and units, and to finance the operation of the supporting construction, repair and supply establishments, it has been necessary to set up within the Navy itself a great business organization for the transaction of its own business affairs. This organization has also been conceived and brought to a state of modern efficiency by a few minds within the Navy.

The business organization of the Navy is centralized in the Bureau of Supplies and Accounts, which is one of the eight principal administrative bureaus of the Navy Department under the Secretary of the Navy.

Prior to 1842, the management and business affairs of the Navy were conducted by the Board of Navy Commissioners organized by the Act of February 7, 1815. This board was abolished by the Act of August 31, 1842, and five bureaus were established, one of which was the Bureau of Provisions and Clothing. This bureau provided the Navy with provisions and clothing and small stores. The other four bureaus provided for their own material needs. The number of navy bureaus was increased to eight by the Act of July 5, 1862, and by the Act of July 19, 1892, the name of the

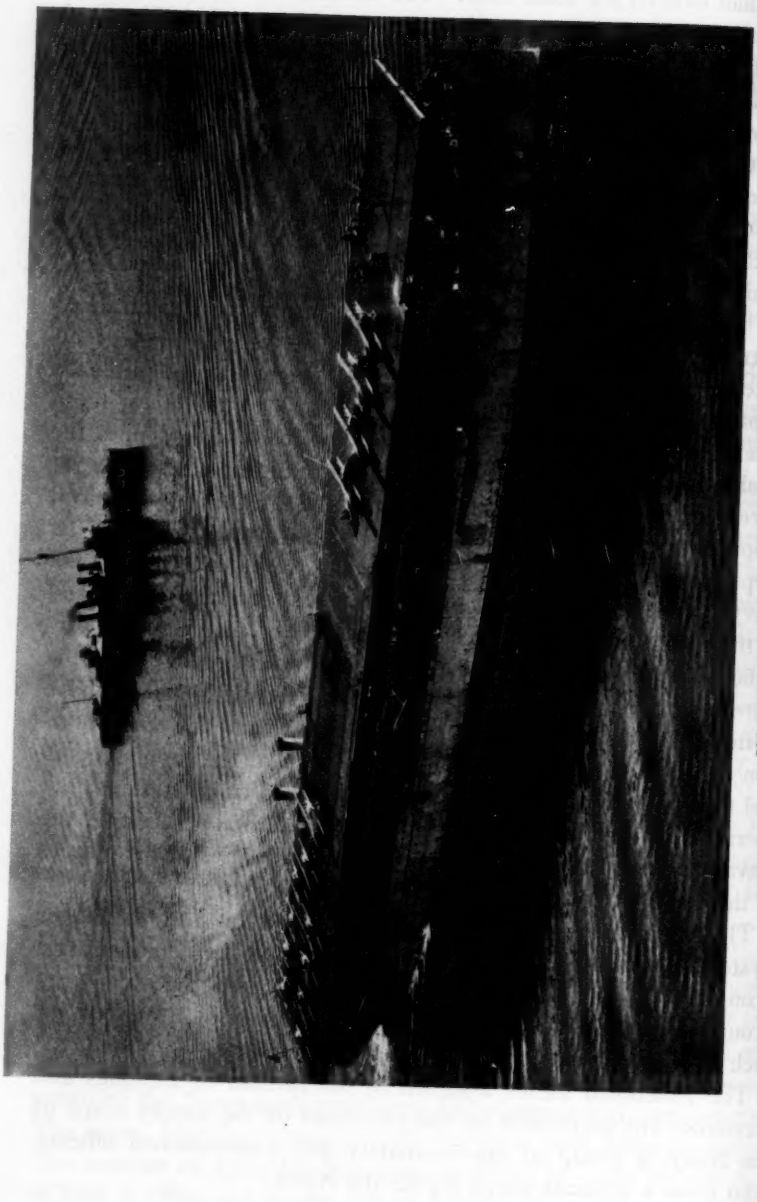
Bureau of Provisions and Clothing was changed to the Bureau of Supplies and Accounts. This change recognized a condition that had existed for some time. The bureau, from having had its functions limited to matters of money, provisions and clothing and small stores, gradually had had entrusted to it practically all the bookkeeping work and a very great part of the supply work of the entire naval establishment.

At the head of the Bureau of Supplies and Accounts is an officer of the supply corps of the Navy, who holds during the tenure of his office a commission as Paymaster General and Chief of the Bureau of Supplies and Accounts with the rank of rear admiral.

The Bureau of Supplies and Accounts maintains a centralized control for the naval establishment over the procurement of all materials (except for the Marine Corps), including the purchase of provisions, clothing, and fuel. It makes all contracts for these general supplies. It stores and distributes them. It supplies the fiscal officers of the Navy with money for disbursement. It receives and accounts for monies on account of the sale of naval property or for services rendered by the naval establishment. It keeps the accounts of all material, supplies, real estate, and of the Navy's money. It keeps records of the cost of manufacture and of the construction and repair of ships and of material. It furnishes to other branches of the Navy, and to Congress and to the Bureau of the Budget, statistical reports in regard to all the above matters. It controls the movement of freight and the transportation of supplies. It controls the management of the supply depots and the supply departments at navy yards and naval stations; the operation of the fuel plants of the Navy and the operation of the Naval Clothing Factory. It supervises the activities of the officers of the Supply Corps afloat and ashore.

The organization of the bureau is based on the "Manager System" and consists of four groups, known as the administrative group, the supply group, the finance group, and the accounting group. For the more expedient accomplishment of its functions, each group is organized into one or more divisions.

The functional duties assigned to the Bureau of Supplies and Accounts are performed by the personnel of the supply corps of the Navy, a group of approximately 580 commissioned officers, who form a separate corps within the Navy.



WHERE THE BIRDS OF THE FLEET NEST
Aircraft carrier *Langley* taking 14 planes out to sea to act as eyes of the Fleet during battle exercises.
21 August 1925.

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Each of the four groups comprising the organization of the Bureau of Supplies and Accounts is managed by a senior officer of the supply corps. These group managers usually have the rank of captain. Approximately twenty additional officers of the supply corps, ranging in rank from lieutenant to commander, are assigned duty in the bureau. The senior officers of this group are in charge of divisions and the juniors act as their assistants.

The other 550 odd officers of the supply corps are scattered on ships of the Navy all over the world and at the various navy yards and naval stations. Wherever they are, these officers are directly responsible for the proper conduct of the Navy's business affairs.

An officer of the supply corps is assigned to conduct the supply department at each navy yard and naval station and the various supply depots established for the sole purpose of supplying the fleet. He has charge of all that relates to the procurement and final issue of materials. Usually a senior officer is assigned this duty and he has as assistants an appropriate number of junior officers and the necessary civilian technical, clerical, and storehouse personnel. He usually maintains three material accounts the first of which—the naval supply account—was established for the purchase and maintenance of stocks of supplies and materials, including provisions and fuel, in common use by the Navy. This account is maintained by a revolving fund which is reimbursed as final issues are made and charged to appropriations. The second account, known as the appropriation purchase account, is an account in which are purchased and carried technical materials such as ordnance, aeronautical and radio material, and special materials purchased for the use of but one bureau. The third account, the clothing and small stores account, is an account in which are purchased and carried the clothing and clothing equipage issued to the enlisted force. Like the naval supply account, the clothing and small stores account is reimbursed as issues are made. A fourth account, the reserve material account, is maintained at some of the supply depots and navy yards. This account was established for the purpose of building up a war reserve of special materials, the fabrication of which requires a long period of time. At present this account is inactive, having only a nominal stock balance.

WHERE THE BIRDS OF THE FLEET NEST
Aircraft carrier *Langley* taking 14 planes out to sea to act as eyes of the Fleet during battle exercises.
21 August 1925.

The average value of these accounts is nearly $700,000,000 and when it is realized that in them are carried upwards of 100,000 distinct items of stock it becomes apparent that the supply corps officer in charge of a supply establishment is confronted with warehousing problems approached only by those of the largest commercial distributing houses. The officer of the supply corps at the head of the supply group in the Bureau of Supplies and Accounts purchases the greater part of the materials for the naval establishment. It is needless to state that it is cheaper to buy in bulk than it is to buy in small lots. Hence a consolidated purchasing and contract system was created in the bureau for the centralized procurement of materials in bulk.

Each navy yard and naval station sends in periodically an estimate of its requirements based upon the quantity of stock it has determined to carry as a maximum. In the stock division of the supply group these requests are checked against excess stock reports of the various yards and stations, revised, and arranged into schedules for advertisement. Requests are then sent to the Navy's mailing list by the purchase division. This list contains the names of over 18,000 qualified bidders. By the term "qualified" we mean a responsible bidder, who dependably controls a dependable source of supply. He may be a manufacturer; he may be a warehouse man only, or he may have neither a factory nor a warehouse, but he has positive arrangements with one or both that enable him to fulfill a contract with the Navy in case his bid is accepted. The Navy endeavors to eliminate entirely the "gambler on futures"; the man who has neither factory, warehouse, nor stock, but who expects to get the material from some one else if he gets the order. Bids are received in sealed envelopes, opened and read in public at a specified time, and the purchase is awarded to the lowest responsible bidder, who guarantees to deliver material in strict conformance with the specifications. It is this principle of wide advertisement, public opening of bids, and public award that has established in the business world the Navy's reputation for business integrity and efficiency. The awards are covered by bureau contracts or orders, specifying delivery at stated times to the various yards and stations, and these activities are furnished with copies of the contract papers. All material purchased is inspected by navy inspectors, either at the point of shipment or at the point of delivery, and when re-

ceived and accepted it is taken up on the books of the receiving supply officer of the yard or station.

The Bureau of Supplies and Accounts also maintains purchasing offices at New York, San Francisco, and Shanghai, China. The supply officer of each shore establishment purchases supplies not covered by contracts made in the bureau or at one of the two coastal purchasing offices and makes emergency purchases. Afloat, the supply officer of the ship performs the functions of purchase.

As a rule, the purchasing officer does not make payments for the purchases. An officer of the supply corps is assigned to the disbursing division of the finance group of the Bureau of Supplies and Accounts, who pays for the purchases made by the purchase division of the supply group. A supply corps officer is assigned as the disbursing officer of each navy yard and naval station, who, in addition to paying for materials and services, pays the wages of the civilian employees; the salaries of the officer and enlisted personnel attached to the station; makes other incidental disbursements and collects and accounts for monies due the United States from individuals and corporations.

Afloat, the supply officer of the ship is the disbursing officer. He pays for purchases of materials and services and the salaries of the officer and enlisted personnel. On the larger ships, a junior officer of the supply corps is assigned as assistant for disbursing. He makes all payments and carries the accounts of the officers and men, relieving the senior of financial responsibility and leaving him free to manage the business of supplying the material needs of the ship and the food and clothing necessary for the comfort of the crew, which on a battleship approximates in numbers a fully recruited regiment. The senior supply officer manages the commissary force of stewards and cooks, the bakeshop, and the galley, or ship's kitchen, the equipment of which rivals the well ordered and completely equipped kitchens of our largest modern hotels. He maintains the stock of provisions and cold storage products; keeps on hand and issues clothing to the crew, and runs a ship's store, a canteen, from which the men can purchase such necessities and luxuries as can be carried on shipboard. He maintains a stock, comprising thousands of items, of general supplies and equipage required for the maintenance and operation of the ship. He keeps records of receipts and issues of all these stores and renders an accounting thereof to the Bureau of Supplies

and Accounts. Frequently, in the midst of these duties, he attends the ship's drills, for in addition to being the ship's business officer the supply officer has military duties and is assigned a battle station.

At each shore training station for enlisted personnel, officers of the supply corps are assigned for the performance of supply, commissary, and disbursing duties, the routine of which is similar to those on shipboard.

An officer of the supply corps is assigned as the accounting officer at each navy yard, at the principal naval stations, and at each of the manufacturing activities operated by the Navy. His functions are distinctly statistical. He prepares the pay rolls of the civilian employees. He keeps the record of the cost of the maintenance and operation of the plant, of the cost of articles manufactured, and of the cost of repair and construction work done. He lodges these costs against the proper naval appropriations, renders appropriate returns to the Bureau of Supplies and Accounts and to other bureaus concerned, and keeps the yard, station or factory department heads advised of the state of their working allotments and of the costs of the various jobs in progress. He keeps the inventory and depreciation records of the plant structures, equipment, appliances, and tools. He compiles the final bookkeeping reports concerned with the materials in the custody of the supply officer.

Officers of the supply corps are assigned as cost inspectors (accounting officers) at private shipbuilding plants and at certain other manufacturing activities where work is being done for the Navy. These officers make a selective and corrective check of the records and reports of cost at those places in order to safeguard the interests of the government. During the late war when much the the major contract work for the Navy was performed on a cost-plus basis, over 250 officers of the supply corps were engaged in the field on cost inspection work. Many of those officers were expert accountants, enrolled as reserve officers of the supply corps.

The officer of the supply corps at the head of the accounting group in the Bureau of Supplies and Accounts supervises all accounting activities. His office audits all accounting returns from ships, yards, stations and naval factories, except the final

audit of fiscal returns which is made in the general accounting office under the Comptroller General of the United States.

It must by now be apparent that the business of the Navy requires a diversified knowledge on the part of its business officers; that they must in fact be specialists. There are, however, additional assignments for which these officers must be qualified. Some of these assignments pertain exclusively to financial administration, others to administrative work pertaining to supply and inspection, and still other assignments are advisory in character. Some of these are mentioned hereunder.

An officer of the supply corps is assigned to the staff of the naval governor of the Virgin Islands. He advises the governor in matters of supply and finance. Officers of the supply corps act as cashier of the government banks of Guam; and Tutuila, American Samoa. One acts as island treasurer, American Samoa. Two senior officers are assigned as general inspectors of the supply corps; one for east coast activities and the other is assigned to the west coast. These officers make frequent inspections of the supply departments of the shore activities and, occasionally, make inspections of the supply departments of ships.

On the staff of the commander-in-chief of each fleet a senior officer of the supply corps serves as aide and fleet paymaster. He is the financial officer of the fleet and advisor to the commander-in-chief in all matters pertaining to money and ship's accounts. He procures monies by transfer from the Treasury Department, or, on a foreign station, by the negotiation of bills of exchange. He transfers these monies to the supply officers of the ships of the fleet as required for disbursement. He makes purchases of materials and services for the fleet, and makes frequent inspections of the money accounts and the administration and condition of the supply departments of ships of the fleet.

In each fleet there is another senior officer of the supply corps assigned as fleet supply officer. His function is to plan for supplies to be delivered to the fleet in sufficient quantities in ample time and with certainty wherever it may be operating. He advises the commander of the fleet train as to the movements of the supply and fuel under his command, and on other matters pertaining to the logistics of supply.

The question might well be asked—where does the Navy get these business specialists? Where are they trained? These ques-

tions lead us into the history of this important staff corps of the Navy.

The pursers of the Navy of the Continental Congress, in the early days of this Republic, sprang from the merchant service of the time, fully equipped for their duties as they were then understood. Those duties were as simple at that time, however, compared with the duties of the supply officer of a modern battleship, as the conduct of business in the late eighteenth century was, compared with the complexity of business methods and practices of today.

As early as 1812, statutory enactment provided "that the pursers in the Navy of the United States shall be appointed by the President of the United States, by and with the advice and consent of the Senate." The terms of the act indicate that this was only legal recognition of a practice already prescriptively established. The name "pursers" was changed to that of "paymasters" by the naval act of June 22, 1860.

The title "paymaster" and the designation "pay corps" as the name of the present supply corps, persisted until the days of the recent war. In both cases these developed into misnomers, however, as the duties of paymasters became more varied and the activities of the corps, along with the activities of the old Bureau of Provisions and Clothing, came to embrace all the functions of supply. In 1918, therefore, the naval titles of the respective corresponding ranks of commissioned "pay" officers were designated for use followed by the words, pay corps. The name of the corps was changed to "supply corps" in 1920, and those words now follow the naval title and with it make up the official title of an officer of the corps as, for example, "lieutenant, supply corps, United States Navy."

Officers of the supply corps are not ordinarily graduates of the Naval Academy at Annapolis. While at the present time the corps is largely recruited from Naval Academy graduates, who are, upon entering the corps, given intensive training in supply corps duties; its older members have, as a rule, been commissioned from civil life. Many are graduates of the great universities of the country and a large proportion have served apprenticeships in business in civil life. Approximately one-half of the corps as now constituted are men who have worked their way up from the enlisted ranks. Many of these promotions were made during the

recent war and principally from the grade of pay clerk, a group of warrant officers, appointed to act as assistants to supply officers.

Candidates for commissions in the supply corps are required to be between the ages of twenty-one and twenty-six years. They must be of a high order of intelligence, business ability, and adaptability, and must have, in general, the elements of character associated at all times with officers of a military service. They must pass a rigid professional examination, in competition with each other, and must be physically sound.

The Bureau of Supplies and Accounts has maintained for its junior officers a school of application in which they were instructed in the principles of business administration, of finance, of economics, and of accounting. In addition, groups of selected officers are given a course of business administration at one of our principal universities. Still others are given courses at the Army Quartermaster Subsistence School at Chicago, at the Philadelphia Textile School, at the Army Industrial School, Washington, D. C., and at the Naval War College, Newport, Rhode Island.

During the last few years the Navy has made tremendous strides in business efficiency, demonstrating the value of the intensive training accorded its business officers.

The business efficiency of the Navy is recognized not only by many of the business men of the nation, who have come in contact with navy business, but as well, by the navies of other nations. Since the recent war, the British Navy has remodeled its supply system to conform to the supply system of our Navy. Similar action has been taken by Brazil and Peru, and consideration is being given the matter by Italy and Spain.

We have seen how officers of the supply corps of the Navy sprang from the merchant marine of early days, nor has this group of officers lost contact with that worthy service.

The Navy operates a limited number of cargo vessels in which is carried the bulk of its overseas shipments. A sufficient number of fuel and supply ships are operated to meet the Navy's peacetime requirements, but in the event of war, recourse must be had to the merchant marine to supply the additional ships needed to transport these supplies, and, if the base of operations is overseas, as was the case in the recent war, additional merchant ships would be required to transport, under the management and pro-

tection of the Navy, the troops, equipment, and supplies of the Army.

When it is conceived that a battleship, cruising at ordinary speed, consumes over 100 tons of supplies, including fuel, every twenty-four hours; that her crew eats five tons of provisions and requires a half a ton of other supplies every day, it becomes apparent that any expedition in which the full force of the Navy is engaged would require a supply train of great proportions.

The process of taking over a merchant ship by the Navy is of vital interest to the supply corps. One of its officers would board that ship at the earliest moment practicable for the purpose of inventorying her supplies and equipage. From a predetermined list of material found to be necessary for the operation of a ship of that type over a given period, he would then prepare his requisitions on the nearest supply depot, and, in a very few hours that officer would be functioning as the supply officer of the Navy's latest ship.

THE "OLD IRONSIDES" CAMPAIGN

By Rear Admiral Philip Andrews, U. S. Navy

BY ACT of Congress of March 3, 1925 the Secretary of the Navy was authorized to receive donations for the restoration of the old frigate *Constitution* that now lies deteriorating at the Boston Navy Yard. The question often and naturally arises in the minds of the people: "Why does not Congress appropriate the money for this purpose?" This question is asked by naval officers as well as laymen, before they learn the real significance of the campaign to restore *Old Ironsides.*

It is very vital to the interests of the campaign that this particular feature of it be understood by all naval officers, so that they, in turn, may be able to explain this point to civilians.

There is no doubt that Congress would readily and quickly have appropriated the money if Congress had been asked, but it was not. The Secretary of the Navy thought that it would be a beautiful exhibit of patriotism if the 21,000,000 children of the country gave small amounts, and raised the $500,000 needed. Already over 10,000,000 children have been reached and have contributed about $148,000. The total so far received from all sources is $246,000.

It has not mattered how much or how little the children gave, provided the school authorities held the exercises in the schools and encouraged the children to study the history of *Old Ironsides* and the early history of the country in the times when she fought her forty-two successful battles. This was the great thought, to get the children to study the history of that time and learn lasting lessons of patriotism and love of country; to appreciate the early struggles of the settlers of this country and the sturdy principles for which they fought. Lessons so learned will abide with children forever, and make better citizens of them. It teaches them what the Navy has done and creates a wholesome interest in good government and the principles on which democracy was founded. The exercises in the schools were instructive and patriotic, essays were written and judged, and bronze and silver medals were given for the best. This whole movement among the children is a de-

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posit in the bank of patriotism which should and will yield big dividends in the future as these children grow up.

The first phase of the campaign among the school children was conducted through the National Benevolent and Protective Order of Elks. This patriotic organization was chosen principally because of its non-sectarian character and because it was able to reach so many schools throughout the country.

In some cities this campaign was at first opposed by the school authorities, who were unable to distinguish this great patriotic movement from a mere drive for funds. This opposition, however, has been rapidly changing to approval, and, in the last few months, many boards of education in the larger cities have withdrawn their objections. Although some cities have still withheld their approval, the national executive committee of the save *Old Ironsides* fund hopes to overcome all this opposition during the coming fall.

It undoubtedly takes time to secure the money necessary through donations from the school children and through individual contributions, but the resulting sentiment and patriotic value of *Old Ironsides,* when restored, will be great.. When children give small amounts they have a proprietary interest in the *Constitution* and a direct personal attachment to the restored ship which when completed will be taken to every possible part of the United States and exhibited to them.

The literature describing the deeds and adventures of *Old Ironsides* and representing the work and the ambitions of the national committee has been sent to all the summer camps for boys and girls throughout the country, with the request that a day be set aside at each camp for some ceremony in commemoration of the victories of the *Constitution.* The aim is finally to reach every boy and girl in the United States and direct their thoughts to the heroic career of this vessel, so symbolic of all that is most admirable in the early history of the nation.

Here, at the Boston Navy Yard, the *Constitution* herself is visited, during the summer months, by an average of 500 people daily. Enlisted men well versed in the history of the vessel and other features of her career show the visitors over the ship and explain every point in her history to these visitors who gladly purchase souvenirs of the famous frigate. The proceeds go to the fund; and a similar source of revenue is found in Philadelphia on board the *Constellation* at the Sesqui-Centennial Exposition.

On Saturday, September 11, the employees of the Boston Navy Yard, with commendable interest in the campaign, asked the Commandant for permission to hold "*Constitution* Day," where the public was invited to the yard to witness a program of sports and other entertainments. In this manner a large sum for the fund was raised. Also, early in September, the Corinthian, Eastern, and Boston Yacht Clubs plan a race at Marblehead for sailing craft of every type, charging an entrance fee for the race, the total amount to go to the fund.

Arrangements will be made for an officer to address the children of members who comprise the junior organizations of these clubs at this time upon the history of the *Constitution* and the true meaning of this campaign amongst the children.

A naval constructor is engaged in making surveys, plans, and specifications for the rebuilding of the frigate, which it is hoped will be commenced next spring, probably in April.

The appeal of the committee for gifts of material for reconstruction has been met in a generous manner. Canvas for a complete suit of sails has already been promised and the committee is now following up the offer of a lumbermen's association of the west coast to donate all the spars. Other offers are of material for the rudder and the rudder stock, the main mast, also offers of beeswax and marine glue, copper sheets, and bolts.

Briefly, when the committee explains the patriotic motive of the campaign among the school children, it has not been difficult to turn people who have been apathetic or even opposed to this campaign into ardent and enthusiastic supporters. This is accomplished as soon as they realize and appreciate the lesson in patriotism that we are teaching the future men and women of the nation.

The Navy, Marine Corps, and Coast Guard have raised quite a large amount for the fund, about $31,000. They have naturally the keenest interest in the rebuilding of *Old Ironsides*. But they can help most by interesting friends and relatives at home and getting their help in overcoming opposition of school boards. The Midshipmen at the Naval Academy, being numerous and freshest from home, can do most in this respect. It has become a navy job to make this campaign a success. We cannot afford to let it fail, and it will not fail.

We depend confidently on the constant help of the Navy which can do much.

RECENT DEVELOPMENTS IN LIMITATION OF NAVAL ARMAMENTS

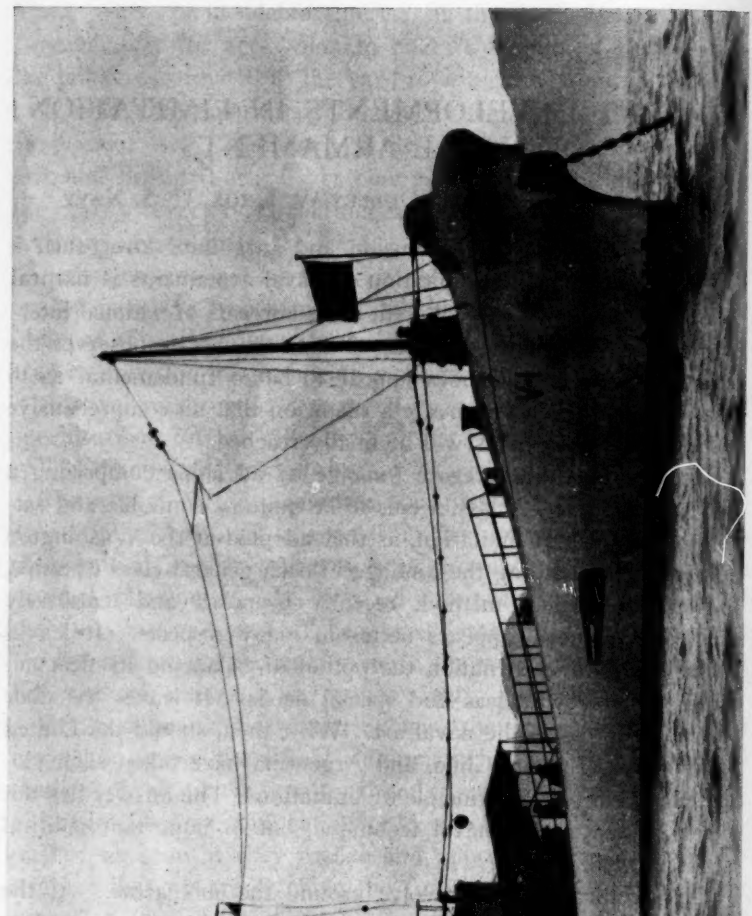
By Captain (Retired) Dudley W. Knox, U. S. Navy

SOME DEGREE of dissension and bargaining over such a vital matter as the limitation of naval armaments is natural and inevitable. The inherent cross currents of national interest are a sufficient cause for this. But to the distant observer the recent differences at Geneva appear to be so fundamental as to occasion surprise and to create a suspicion that no comprehensive and effective agreements will be finally reached.

Superficially the aggregate tonnage of all ships comprising a navy, irrespective of class, seems to be quite as equitable and satisfactory a basis of limitation, as that adopted at the Washington Conference of limiting the tonnage in each general class of ships. In fact the former method, recently proposed and tentatively adopted at Geneva, appears better in many respects. It leaves in the hands of each nation the option of balancing its fleet according to its own ideas and special needs. It leaves the door open to progress in the naval art. Why, then, should the United States, Great Britain, Chile, and Argentina have taken such violent exception to this principle of limitation? The answer lies not merely in matters of naval technique, but in important political trends as well.

The technical aspects revolve around the submarine. At the close of the World War the tonnage of allied craft devoted to anti-submarine work was about fifteen times the aggregate tonnage of the submarines of the central powers. Of this anti-submarine tonnage perhaps half represented vessels of commercial type commandeered for war purposes. In any event it seems certain that the tonnage of regular naval vessels available for anti-submarine work could not safely be reduced below five times the tonnage of submarines against which they were expected to operate with success.

To illustrate what this might mean on the "total tonnage" basis of limitation, let us suppose that France should choose to put all



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of her allotment of tonnage into submarines. If the Washington Conference ratio of 5 to 1.75 between Great Britain and France were adhered to in the aggregate tonnage agreement, Britain could not consider the luxury of having battleships. Her entire navy would necessarily be restricted to anti-submarine types, and even then would be nearly forty per cent short of the safe minimum for combating French submarines.

The principle involved is illustrated by what may seem to be an extreme case. Yet the extremity is quite within the bounds of probability because of the peculiar situation of France. Her needs for security ashore necessarily absorb so much of her total power as to prevent any adequate naval defense against the surface fleet of Britain, upon whose good will France must therefore now depend for the safety of her overseas trade and an exceedingly large colonial empire. More than this her very security against powerful neighbors on the continent depends at present upon the sea communications with north Africa—always at the mercy of the British. France's best "counter" to possible British aggression is an ability to vitally threaten British shipping, which a swollen submarine force would certainly insure her.

Our situation with respect to the defense of the Philippines is sufficient justification for the United States siding with Great Britain in opposing the "total tonnage" basis of limitation. With a ratio of 5 to 3 between us and Japan the latter could retain some battleships, cruisers, etc., and in addition build more submarines than we could possibly neutralize, even if we should use our entire quota of total tonnage for anti-submarine types.

It is easy to put forward the argument that what is fair and advantageous for one nation is equally so for the other. If France or Italy could build submarines in great numbers and place British interests in great jeopardy, so could Britain go in for submarines in quantity and threaten them. The fallacy lies in a vital difference of interests, and material circumstances. Insular Britain simply cannot afford to have her sea communications severed, whereas continental France or Italy could carry on for a considerable time without normal access to the sea.

It should be easily manifest that, notwithstanding theoretical considerations to the contrary, the Washington Conference method of limitation by classes of ships is the only practicable

method. The advancement of the total tonnage basis therefore seems to have obstruction in view rather than agreement.

Explanation of obstructionist motives may be found in what France regards as her humiliation at the Washington Conference. For the first time in some hundreds of years she was there classed as a second-rate naval power. It is true that her navy was then actually in the second class, and that the *status quo* basis of limitation was necessary to any agreement. But France felt that her case was a special one, in view of the recent need of her neglecting naval armament in favor of land forces, in the general allied cause. She felt that her low naval rate was but temporary, yet nevertheless, in the interest of agreement, she accepted the *status quo* in capital ship tonnage, as a basis of limitation in that class, intending to plead for special consideration when it came to auxiliary tonnage limitation.

France did so plead, but the case was turned against her by superior diplomacy and propaganda. By such means was it made to appear that France was unwilling to limit submarines, and therefore responsible for the conference failing to reach any agreement on limitation of auxiliary tonnage. The fact is that France offered to limit her submarines to 90,000 tons—precisely the same submarine tonnage which had been previously proposed by Mr. Hughes, and tentatively accepted as appropriate for the United States and Great Britain. The British declined to consider any limitation of any type of auxiliary tonnage on the basis of 90,000 tons of submarines for France. Thus was the deadlock brought about, and French pride deeply wounded.

How much better it would have been for Britain, and all the others, if she had accepted the French offer, or had bargained for a reduction from the 90,000 tons of submarines. It seems probable that France would have come down to 80,000 tons, or even 70,000 tons, if British and American submarine quotas had been likewise pared. But even on the 90,000 basis of French submarines, the proposed British quota of 450,000 tons of other auxiliary tonnage was reasonably sufficient, together with the great quantity of small commercial craft always available in British waters, to meet a French submarine menace. If Britain had been wiser at Washington probably she would not now be faced with unlimited submarine power all along her vital communications from Scapa Flow to Port Said, for now it is not

only France, but Italy, and all the small European states also, who wish freedom in submarine construction.

In many of these cases the motive is merely a feeling that the submarine is the cheapest mode of naval defense for weak states against aggression by powerful navies. But Italian thought seems to lie deeper and to be more significant politically. It comes as a great shock to Britain to find her traditional naval friend lined up with her traditional naval competitor. How strange the French must feel to have Italians backing them against British!

The explanation seems to lie in recently expanded Italian aspirations, which if persisted in, must have far reaching political and naval consequences. The new nationalism inspired by Mussolini, together with pressing needs for economic development and room for surplus population, have all contributed to a rapidly growing ambition for an Italian Empire, which necessarily assumes oversea expansion backed by naval power. The trend of Italian thought is indicated by the abortive seizure of Corfu, the more recent visit of Mussolini to Tripoli, the decision to build a big naval base at Rhodes and a battleship base in Sicily, and the attention which is reported to have been given to the selection of suitable submarine and air bases at various points. That these developments are taken seriously in Europe is indicated by the perturbation of Greece who has represented that Cyprus should be handed over to her as a balance against Italian developments in Rhodes, and more strikingly by Turkish acceptance of British claims in the Mosul region.

One might assume that there has been some sort of understanding between Italy and France encompassing a friendly division of interests in the Mediterranean. This view would be supported by the line up at Geneva, with Italy and France opposing Britain on the submarine issue—for that is the real issue wrapped up in the question of a "total tonnage" basis of limitation. Also opposing Britain we find Greece, Bulgaria, Spain, Belgium, Germany, and Scandinavia. The difficult problem of the great sea carrying nation, if opposed by almost any combination of European powers after "total tonnage" limitation had been agreed upon, is apparent.

While the submarine matter has somewhat unexpectedly thrown in the background the important question of limiting cruiser and other auxiliary tonnage, the latter must nevertheless have had

considerable influence upon the proceedings at Geneva. A few days after the Council of the League of Nations fixed the date for the present conference at Geneva, Mr. Bridgman, First Lord of the British Admiralty, made an important speech clearly indicating the position which Great Britain would take toward limitation of auxiliary tonnage. He said: "It would be a very dangerous thing for this country to allow it to be thought that we could be satisfied with a one power standard in cruisers, for example. In cruisers we wanted to feel that we were, at any rate, superior to other countries and were able to afford protection to our trade."

This very significant statement, indicating a reversal of the British limitation policy since the Washington Conference, must have occasioned considerable surprise in other capitals and influenced the projected diplomacy to be followed by the other powers at Geneva. How much superiority in cruisers, for example, Britain would hold out for was difficult to estimate. If Britain intended to scrap the basis of the Washington agreements, why should not others follow suit, and moreover in a way which would checkmate British efforts to gain surplus auxiliary tonnage? The most obvious manner of accomplishing this was the "total tonnage" proposal.

The radical nature of the British switch in policy respecting auxiliary tonnage is not generally recognized. It will be recalled that the initial proposal of Mr. Hughes at Washington was a comprehensive, well-balanced plan of limitation which included all classes of tonnage, in which the ratio 5-5-3-1.75 governed throughout as an essential and fundamental factor. The Hughes plan as a whole was not only formally agreed to "in principle" by all the powers represented, but those features pertaining to auxiliary tonnage were specifically accepted by the British delegates. In addressing the conference Mr. Balfour said: "We have had to consider and we have considered the great scheme laid before you by our chairman [Mr. Hughes]. We have considered it with admiration and approval. We agree with it in spirit and in principle." . . . . It deals "with the three great fleets of the world, and in the broad spirit in which it deals with those fleets, in the proportion of disarmament which it lays down for those fleets, the government of the country which I represent is in the

fullest and heartiest sympathy with the policy which the United States has brought before us for our consideration."

In the same speech Mr. Balfour said further:

> Taking these two as really belonging to one subject, namely, the battle fleet; taking these two—the battleships themselves and the vessels auxiliary and necessary to a battle fleet—we think that the proportions between the various countries are reasonable; we think the limitation of amounts is acceptable; we think it should be accepted; we firmly believe that it will be accepted.

Here is a very clear moral acceptance of a ratio of equality between Britain and America, provided by the Hughes plan, not only in capital ship strength but also in general fleet strength, of which cruisers and other types of fighting auxiliaries constitute an important element. This has formed the basis of the American attitude on new naval construction since the Washington Conference, and largely on account of such understanding America refrained from building new cruisers until Japan and then Britain had gone ahead with extensive programs.

Yet it is not wholly on what Mr. Balfour said at Washington that American and other opinion as to British policy respecting cruiser and other auxiliary quotas has been based. As late as 1923 the naval policy of the British government was officially stated to be in accord with the 5-5-3 ratio. The explanatory statement of Lord Lee of Fareham, First Sea Lord of the Admiralty, in submitting to Parliament the navy estimates for 1923, contains the following:

> As stated last year, estimates can only be based upon policy, and the naval policy of the government, as approved by Parliament and implemented at Washington, is to maintain a "One-power Standard"—i. e. that our Navy should be not inferior in strength to that of any other power. The duty of the Admiralty is to carry out that policy, with the strictest regard to economy, giving the utmost weight to the changed and improved international conditions which have resulted from the Washington Conference.

These formal statements of Balfour and Lee, accepting both in principle and fact, with reference to both capital ships and auxiliaries, the Washington Conference ratio of 5-5-3, are in sharp contrast with the reverse policy announced more recently by Bridgeman, that it would be "dangerous" to "allow it to be thought" that the British "could be satisfied with a one power standard in cruisers, for example." Hence it was a fair assumption

that at Geneva the British would endeavor to scrap the principles agreed to at Washington. This seems to have been anticipated by the French, who went them one better, with the unfortunate result that at this writing the whole conference appears to be abortive, and no correction of the great loophole in the Washington agreements seems in sight. Until limitation in capital ship tonnage is supplemented by similar restriction on auxiliary tonnage, the Washington naval treaty must continue to fail in accomplishing its declared objects.

LAW AND ORDER OR ?

By Major General Amos A. Fries, U. S. Army,
Chief of Chemical Warfare Service

ONE HUNDRED FIFTY years ago, fifty-two men signed their names to an immortal document, the Declaration of Independence. They were educated men; they were students; they were thinkers; they were believers in law and order. They believed in God and the responsibility of man to man. They believed further a most unusual belief in those days—that all men are created equal, that they had certain inalienable rights that nobody might deny, that all possessed the right to life, liberty, and the pursuit of happiness. These later beliefs were felt by those imbued with the divine right of kings to be outlaw thoughts, and yet, as just stated, these fifty-two men were deep believers in law and order. Indeed, so deeply did they believe in law and order and the necessity for anyone taking liberties with any law to defend his actions and state his case, that they began their immortal document with this sentence:

> When in the course of human events, it becomes necessary for one people to dissolve the political bands that have connected them with another, and to assume among the powers of the earth, the separate and equal station to which the laws of nature and nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.

Following that declaration, a long drawn out, weary war tested the endurance and strength of the thirteen struggling colonies as never before or since. When peace was signed seven years later, all for a little while were overjoyed that they had at last become free and independent and had assumed among the nations of the world that free and equal place to which they were entitled. And then came trouble and more dark days; darker and darker they grew. There were thirteen governments living side by side, each with the right to establish custom barriers against its neighbors, each with the right to impose taxation and raise armies, and none with the power to enforce those laws. Possible anarchy threw its

RELEASING PLANE FROM CATAPULT, U. S. S. "MARYLAND"

terrible shadow across the land. Chaos seemed to loom as the end with final dependence on some monarch as King George III, or worse, and the cause for which they fought would be lost. The wise ones saw that law and order must be provided for, that a government must be evolved which would have authority to make laws and the power to enforce them. Failure meant that anarchy must come and after that, no man knew what.

Ten years after that band of fifty-two men signed the Declaration of Independence, another little band of men gathered as the first had gathered in Philadelphia. They gathered in old Independence Hall and there for four long, hot months they talked and wrote and struggled with God and their consciences, and the history of mankind's endeavors to achieve freedom under the law. Eventually, they wrote another immortal document—the Constitution of the United States. Following the writing of the Constitution, they had the wisdom and the steadfastness of purpose to put that law into effect and to interpret its words and phrases in a way to make the government strong and powerful, and yet to leave to all that inherent right of life, liberty, and the pursuit of happiness.

RELEASING PLANE FROM CATAPULT, U. S. S. "MARYLAND"

Times have changed since 1776 and 1786. Events move with the speed of the lightning that Benjamin Franklin in Philadelphia first brought from the clouds down his little kite string. With that speed of movement there have arisen new problems. With new problems there must be developed new methods of meeting them. As a result we have today organization after organization, some wonderful, some simply good, some simply indifferent, and some extremely bad.

There is abroad a great fashion of talking universal brotherhood and internationalism. Let us thank God that there are great men and fine women taking the lead in teaching nationalism, in teaching that this country has grown great because it has been intensely national. It has for a century and a half avoided entangling alliances. Curiously enough, out of what has been felt to be the most intensely peaceful eight years of our national history there grew the Monroe Doctrine, essentially a doctrine of nationalism. It went so far as to say that not only was the United States to be free from encroachment but that every other government on the American continent should be free from foreign control if it lay within the power of the United States to guarantee that freedom.

All the history of mankind teaches nationalism as against internationalism. Internationalism in intercourse for social and business purposes is to be encouraged to the greatest possible extent, but an internationalism that says that any foreign power may interfere in the affairs of our government inside its own borders cannot be tolerated. If tolerated, we cease to be a free people and if such an evil should come we will that day have started over the brink of ruin.

Every development of mankind that has made for present day civilization has come through vigorous, proud nationalism of some people within the last four or five thousand years, whether it is the law and organization of Rome, the art and science of Greece, the writing and the alphabet of the Phoenicians and Chaldeans, the religion of our Bible by the Hebrews, or the rights of man as developed by the Anglo-Saxons of the Baltic Sea, the British Isles, and finally by Americans. At no time nor anywhere did a polyglot people with a babel of tongues do other than drag the nation so cursed down to the level of the lowest. It was true of Greece and it was true of Rome. It was true of the Jews, the Babylonians, and the Phoenicians. The United States is a beacon light to all the world and has done more to speed up the development of civilization than anything else in all history, because it was brought forth as a closely knit nation, one in which all spoke the same language, had the same ideas of morality and religion, the same enemies and the same goal for the future.

It is a thing for which in the words of Patrick Henry we can thank Almighty God that there are numerous patriotic organizations standing resolutely for a nationalism that will open its doors only to those foreigners that want to become Americans—for a nationalism that will open its doors to foreigners hereafter only in such numbers as they can be taught the laws, the ideals, and the aims of America. With 110,000,000 we could, if necessary, get along without another immigrant and still go on to greater and greater things as the years go by. One hundred ten million people give ample diversification of physical being, intelligence, and all other things needed to make the nation continue its marvelous development.

The subject, "Law and Order or?" has been chosen for the purpose of discussing some of the dangers that face our nation

through the activities of widely scattered groups claiming various ideals.

No matter in what other ways they may differ the pacifist, and the communist, the misguided optimist, and the Red Soviet of Russia have one thing in common; they are all trying to disarm America. Whatever their professions or intentions, the result would be the same. America disarmed would become the prey of the greedy, the brutal, and the misguided, both from within our own borders and from without. Calm reflection must convince every sane person that disarmament means national oblivion and national disgrace, and perhaps the blackest, most murderous page in all history. Today, Soviet Russia holds that frightful distinction.

The communist is international. He is likewise interracial. The communists of Russia, realizing that communism is international, know that unless they can bring other countries into the ranks of the Soviet, sooner or later Russian communism will die as all other attempts at communism have perished in the past.

There are really very few Americans in favor of disarmament, or an America that is weak militarily. These few, however, are very active and well financed. It is a grave mistake to ignore or even to underestimate their power for evil. The world's history is filled with stories of rule and ruin brought about by a very active minority, dealing with a careless, self-satisfied, ignorant, or unorganized majority. Russia is an example of the terrible fate that has befallen many a nation through allowing an active radical minority to seize complete control.

In attacking national defense, they first centered on three new services because like all new weapons or services these three have been widely advertised and often in a very unjust manner even by well meaning but uninformed persons. Those three services are chemical warfare, aviation, and submarines. Of the three, chemical warfare, or poison gas, because of its extreme newness and appeal to the imagination, has been seized upon by all classes of disarmament advocates as the Verdun that must first be destroyed. Notwithstanding the evidence is conclusive beyond any shadow of doubt that war gases are the most humane, the cheapest and the most effective means of national defense, the attempt is being brazenly pushed to condemn these gases as barbarous and their use as unfair.

Gas warfare is not barbarous compared with other methods of waging war. The official American medical records of the World War show that barely two out of each hundred gassed died, while twenty-five out of every hundred struck with shells, bullets, bayonets, and bombs died. What do those figures mean? They mean that if the 70,552 American boys who were admitted to hospitals in the World War suffering from chemicals (gas) had been struck by shells, bullets, bayonets, and bombs, 16,455 more American boys would be buried in "Flanders fields where the poppies grow."

And that isn't all. Of those who would have come home; had bullets, bayonets, and bombs been used, instead of gas, an additional 3,161 would be totally or partially blinded, or crippled by stiff joints or missing hands, feet, or limbs. Thus, the mothers, sisters, sweethearts of 19,616 boys who served overseas can thank God that the Germans used gas.

While many people are misled and many are too thoughtless or too indifferent to try to learn the truth, the leaders in this disarmament movement *know better,* or are *ignorant because they avoid* the truth.

The whole Pacifist-Radical-Communist movement in America is foreign in its conception, if not actually under foreign influences, direction and control. For instance, according to the official history of the Women's International League for Peace and Freedom, that organization was started by two foreign women, Mrs. Pethwick Lawrence of England and Frau Rosika Schwimmer of Hungary, who came over here in the fall of 1914 and lectured widely in the United States. Immediately upon the completion of the lecture tour a conference was called in Washington. A larger conference was held February 27, 1915, followed in July of that year by a committee of forty-seven going to Europe and starting an international pacifist organization.

Early in 1921, several pacifist organizations started to develop propaganda for the Washington Arms Conference called November 12, 1921. Under date of August 26, 1921, the Women's Committee for World Disarmament sent out a three page mimeographed bulletin in which this sentence is used:

We must insist on disarmament, not limitation of armaments as the main issue.

The irrationalism of many of these attacks on national defense is well illustrated by statements made in a congressional hearing

of January 11, 1921, where near the bottom of page 45 of the hearings, the following four remarkable statements are found:

If it is possible by international agreement, as we know it is possible, to reduce armaments fifty per cent, it is possible by agreements to reduce them 100 per cent.

The carrying of weapons by individuals is now quite generally regarded as a menace and in most communities is classed as a felony or crime. "Gun toting" this is called in Chicago, where I come from, and drastic laws are enforced to prohibit it. Gun toting is just as dangerous and reckless for a nation as it is for an individual.

The above statements are what Abraham Lincoln so beautifully termed "counterfeit logic." The idea conveyed there is that the United States Army and Navy is on a par with the crooks, villains, and murderers of Chicago who carry guns, and that they are the same menace to the nation that those crooks and murderers are to Chicago. Yet, precisely the reverse is true. The police of Chicago are fully armed. Nothing is said against the police. The police are there to protect the innocent from the murderers and gun toters. The Army and Navy of the United States is to protect the citizens of the United States from those criminals, communists, or others, who would overthrow the government through revolution within and set up a murderous Soviet, as well as to defend it from aggression from foreign foes. In ending the statement five didactic sentences were used. The fourth one reads: "Disarmament, like charity, must begin at home." Here again we have the same proposition put forth by other members of the committee of seven women appearing before the military committee, that the *United States should disarm as an example.* China has been disarmed for 2,000 years and is a beautiful example. Would those seven women have us in condition to be overrun by other powers of the world as China is now overrun?

Such preaching is so dangerous that it is believed every American should be acquainted with the result if such preaching should prevail. To disarm, which means to disband all military forces, would be just as deadly to the national government as the disbanding of all police forces would be to our cities. In fact, it would be far worse, as our big cities would organize vigilance committees to take over and handle the police work. You can't organize armies and navies over night as you can vigilance committees—it takes years.

What would take place in any great city if the police force became destroyed, was indicated in Boston during the policemen's strike in 1920. The police had not been on strike more than a few hours until stores and buildings were being broken into, men and women were being assaulted, stores robbed, and general disorder and chaos getting under way. Any nation, if there were no military organizations, would be subject to the same terrors, only a hundred times worse, if a civil communist revolution were started and there were no military to take up the defense. It must never be forgotten that a civil communist revolution is what Russia is preaching today and what the American people must accordingly be prepared to prevent.

In a bulletin issued by the National Council for the Prevention of War January 7, 1922, there occur three exceedingly important sentences:

> Human nature is not equal to the outlawry of war in one step, but it is equal to its outlawry piecemeal. . . . . If war came, it is conceivable that these efforts to limit its horrors might prove unavailing. A struggle in which existence is at stake admits of no rules that would prevent *sure* victory.

The patriot reading the above will ask himself why he should run the chance of giving any enemy an opportunity for sure victory. He will also ask himself why does the pacifist urge disarmament when he, himself, feels that in a struggle in which existence is at stake there will be "no rules that will prevent *sure* victory." What would happen to our country if the advice of such people were taken?

Where do these pacifists link up with the communists? Let us see. The National Council for the Prevention of War and the Women's International League for Peace and Freedom have urged the recognition of Soviet Russia, a government that is endeavoring to overthrow the government of the United States by force and violence. The Women's International League for Peace and Freedom protested against the deportation and exile of "reds," who advocate the overthrow of all existing civilized nations by force and violence. According to their own official history they believe that "free access shall be given to raw materials"; in other words, we should turn over our farmlands, our forests, our mines, to foreigners on the same terms that we work them ourselves.

Among resolutions adopted by the Women's International League is this: "The initiation and support of laws looking to the abolition of property privileges." Mothers and fathers and patriotic Americans everywhere! Do you know what that means? If you abolish property privileges, you abolish civilization. Man made no progress whatever in civilization until he was assured that in some measure at least the fruits of his labor would go to his widow and his orphans. Without that incentive there would be no civilization. Further, that idea is the end and aim of communism—the communism of Soviet Russia—the communism of the Third Internationale that is plotting day and night to not only overthrow the government of the United States but other civilizations and countries of the world by force and violence and to impose on those civilizations the black, murderous page of history such as has been imposed on Russia.

And these are the people who are trying to write our laws, teach our children, and tell us to be as unprepared as China, knowing full well that if we are as unprepared to defend ourselves as China, we will be controlled as China is controlled.

References have been made to Russia. The various pacifist organizations discussed have nothing but kind words for Soviet Russia though frequently they bitterly arraign the United States. Soviet Russia is the one modern existing government that claims to be communist—a government where all property is owned by the state. There are of necessity a few recent exceptions. Moreover, it is common knowledge throughout the world that Soviet Russia has been, and is now, sending her agents and written propaganda to all of the civilized countries of the world. Those agents and that propaganda aim at the overthrow of all existing governments—("capitalistic governments" they call them), and establishing in those countries, including the United States, Soviet Republics. They urge the abolition of the Army and the uprising of the workers. There are just two methods by which they hope to achieve the overthrow of the present governments.

The first method is to spread communism among the labor organizations and at the same time to get communist agitators as leaders in control of labor. The next step is to call a general strike, paralyze transportation, inaugurate an era of starvation in cities, then seize arsenals, banks, commercial houses, police forces, and set up Soviet republics with their radical leaders in command.

The next step, of course, is the murder of every independent man and many of the independent women, who they feel are a danger to the institution of Soviet communism.

The second method by which they expect to overthrow governments is to spread treason in the military and naval services, so that in case of a foreign war, the Army and Navy can be induced to turn traitor, as was the case with Russia in the World War. The soldiers and sailors are expected to murder their officers, permitting the radical communists in the ranks to assume leadership. From that time on, the process would be as above mentioned,—that is, the seizure of arsenals and transportation, then murder, chaos, starvation. All of this sounds brutal. One might even think the writer was having a nightmare, if it were not that this is exactly what transpired in Russia and Hungary.

THE SECOND YEAR OF AVIATION AT THE NAVAL ACADEMY

By Captain H. A. Baldridge, U. S. Navy,
Head of Department of Seamanship and Flight Tactics,
U. S. Naval Academy

SOME sixteen months have passed since the Secretary of the Navy issued orders establishing a three-month post graduate summer course in aviation and aeronautics at the United States Naval Academy for the graduating class. This same order also provided for the further addition of aviation subjects in the regular four-year curriculum.

Naturally, one of the first questions asked about this order was "What will be the effect upon the parents of the 1,700 midshipmen of the regiment in view of the *ex post facto* nature of the order?" Would the parents feel that they had not sent their sons to the Naval Academy to be aviators? The answer has been a complete surprise to everyone, as to date the Superintendent of the Naval Academy has not received a single letter from parents on the subject, and the Chief of the Bureau of Navigation has received only three: one expressing approval of the Department's action, and the other two inquiring about the nature of the course, without further comment.

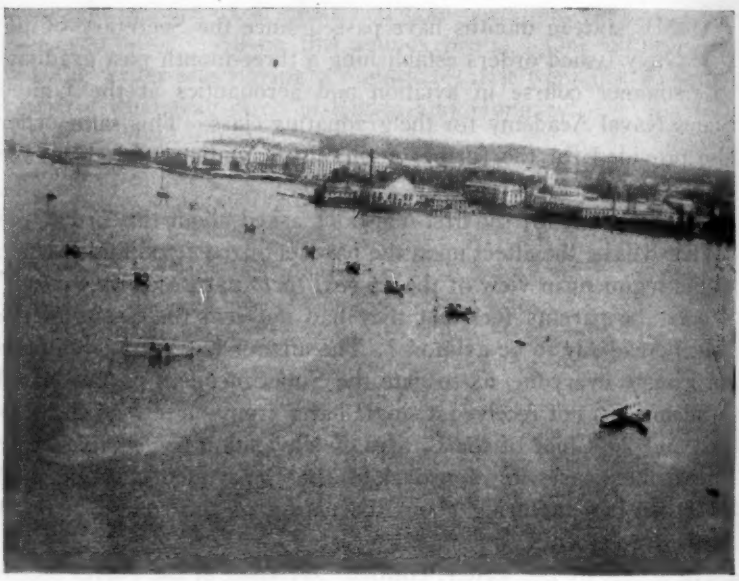
An article by the writer, entitled "Aviation at the Naval Academy," descriptive of the first summer's work, appeared in the September, 1925, issue of the Proceedings. Briefly, the course lasted twelve weeks. To inaugurate it, 152 midshipmen of the first class (1926) remained at the academy instead of making their first class summer cruise. The course, planned with the assistance of naval aviators from Pensacola and the Bureau of Aeronautics, was practically the same as that prescribed for the "ground school course" and "ground gunnery" at the Naval Air Station, Pensacola, Florida, the textbooks being the so-called "Pensacola (Aviation) Manuals." Pensacola graduates, using Pensacola methods, were in immediate charge of the instruction and the marking of examination papers. The flight instruction

in the air was given in planes of the *H-16* and *F-5-L* types. An aircraft division from the aircraft squadrons, scouting fleet, was temporarily based at the Naval Academy for this purpose.

The class visited Philadelphia for two days and inspected the aircraft factory. The course was further supplemented by twelve lectures on general aviation subjects.

Summer Course—1926

During the last academic year, 1925-26, aviation subjects were added to the four-year curriculum for both the second and first



Courtesy of J. A. Pringle, Photographer 3C, U. S. Navy

U. S. Squadron Training Planes at Anchor, Naval Academy

classes. The first class was drilled three times a week in radio code practice, and the second class in blinker signals. The first classmen were instructed in such ground school subjects as aircraft communications, aviation history, aerology, aerial navigation, aerial navigational instruments, aircraft radio instruments, aviation engines, structure and rigging, aerial gunnery, and aerial bombing.

The class consisted of the 293 members who did not take the summer course in 1925, and was composed of 272 ensigns and

twenty-one second lieutenants of the Marine Corps, newly commissioned.

No additional department, such as a Department of Flight, was found necessary at the academy, as the nature of the ground school subjects was such as to readily suggest their allocation for the most efficient administration. For example, navigational (aerial) instruments and aerial navigation are handled by the regular academic Department of Navigation. When it is understood that comparatively few additional assignments to the regular

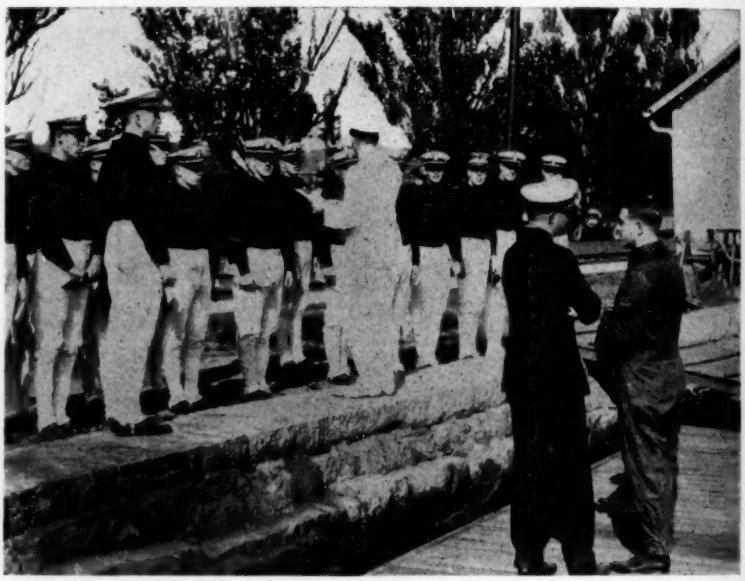
Courtesy of J. A. Pringle, Photographer 3C, U. S. Navy

TRAINING PLANE
Summer Aviation Course, U. S. N. A.

curriculum in navigation are necessary to include as much or more than is given in the Pensacola Manuals, it appears unnecessary to have an additional staff of officers to instruct for only a few recitations in a particular kind of navigation. In the same manner it was decided that the Department of Engineering and Aeronautics should be assigned the subjects of aviation engines, structure and rigging, practical work in engine overhaul, and engine test stand. This department's organization, already well fitted to instruct in naval construction, thermo-dynamics and internal combustion en-

gines, was the logical one to handle the specialized aviation engineering subjects allotted to it.

Likewise the regular academic Department of Ordnance and Gunnery was allotted the theoretical subjects of aerial gunnery and aerial bombing, together with practical work in both as well as range gunnery. The Department of Electrical Engineering and Physics was allotted aircraft radio instruments and theory of flight (aerodynamics) and during the summer course also handled radio code practice, although during the four-year curriculum the



Courtesy of J. A. Pringle, Photographer 3C, U. S. Navy

STUDENT OFFICERS RECEIVING SAFETY INSTRUCTIONS

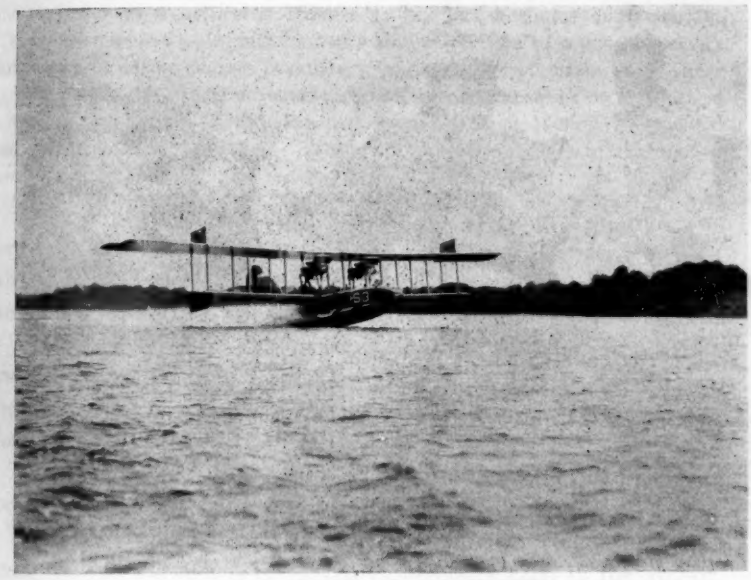
latter is handled by the Department of Seamanship and Flight Tactics.

The Department of Seamanship and Flight Tactics was allotted aviation history, aerology, aircraft scouting, strategy and tactics, combat and flight formations, and aircraft communications.

There are permanently assigned throughout the year among the departments referred to above five naval aviators as expert advisors. The Naval Academy has always endeavored to have a certain percentage of the commissioned instructors in the respective professional departments who were experts in their respective

specialties, such as naval constructors and officers skilled by service afloat in fire control, torpedoes, gunnery, radio, electricity, navigation, and engineering.

The first three weeks of the summer course of 1926 were devoted to the completion of such ground school subjects as were not completed during first class year as midshipmen, and consisted of aerial gunnery, aerial bombing, with practical work in each, theory of flight, aircraft scouting, together with solutions of an aircraft scouting problem involving employment of aircraft car-



Courtesy of J. A. Pringle, Photographer 3C, U. S. Navy

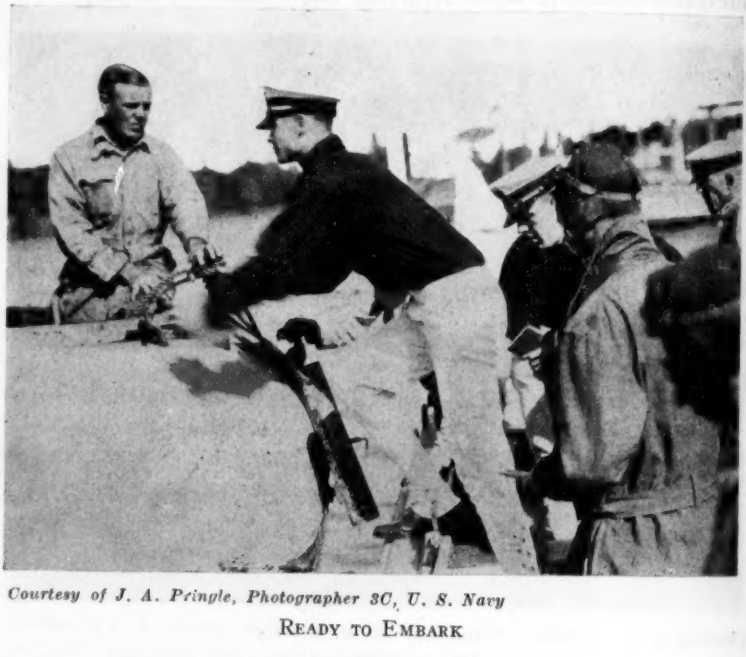
READY TO TAKE OFF

riers, bombing planes, fighting planes, and destroyers. Other theoretical subjects completed were aviation engines and structure and rigging.

The next seven weeks of the summer course were devoted to practical work in range gunnery in the use of aircraft machine guns on the rifle range, practical work in aerial bombing and aerial gunnery, engine test stand work (in which the student officers were instructed in "trouble shooting," consisting of putting the engines out of commission by drill instructors and requiring the student officers to locate and remedy the troubles),

practical work in engine overhaul and in structure and rigging.

In addition to the above each student officer made an average of six separate flights in planes of the *H-16* and *F-5-L* types, averaging about eleven hours. The instruction in the air was for the purpose of supplementing the theoretical and practical instruction of ground school and range gunnery subjects, and consisted of instruction in the duties of radioman, gunner, mechanic, navigator, and observer. This instruction was given by officers of



Courtesy of J. A. Pringle, Photographer 3C, U. S. Navy

READY TO EMBARK

V-S Squadron One from the aircraft squadrons, scouting fleet, attached temporarily to the Naval Academy for this purpose.

No attempt was made either this summer or last summer to give the student officers instruction at the controls, as the pilot instruction part of the graduate's training will come after leaving the Naval Academy. Navy Department General Order No. 152 provides that hereafter each graduating class will, during the first year after graduation, be given twenty-five hours instruction in the air at the Naval Air Stations at Hampton Roads and San Diego, consisting of photography, radio, bombing, gunnery, and dual control.

With regard to the mission of the Naval Academy aviation course, the following might well be quoted from the orders of the Superintendent of the Naval Academy:

In order to present a clear understanding of the basis of the Naval Academy course of instruction in aviation, the following comments are made:

It is not a course to qualify aviators. It is a course to give the graduates as a whole an understanding of the fundamentals of aviation as a part of general naval education. No attempt is made, or intended, to qualify any individual as an aviator any more than the making of an ensign the navigator of a battleship because he has had a course in navigation. The aviation course at Annapolis bears similar relation to a general service foundation as do the courses in gunnery, engineering, navigation, etc. There is included in the academic course certain theoretical work in connection with the fundamentals of aviation, both from the point of view of material and operation, but this is only preparatory in the same way that trigonometry is preparatory to astronomy and navigation.

During the entire summer course the student officers were instructed in radio code practice, and out of 291 student officers who completed the course, 273 attained a speed of eighteen code words per minute, and only ten failed to attain a speed of fifteen.

The entire class had a two and one-half days' carefully planned and supervised visit of inspection and instruction at the aircraft factory at Philadelphia and also inspected the new aircraft carrier *Saratoga* being built at Camden.

The night periods were assigned for study, a prescribed reading course, and twelve lectures on general aviation subjects.

There were no casualties in either the summer course of 1925, when 152 midshipmen were given eight hours each in the air, or during the summer course of 1926, when 293 student officers were given eleven and a half hours each in the air, involving over 3,200 hours and over 40,000 miles of flight.

Despite the fact that approximately 450 graduates of the class of 1926 have taken this course in the past sixteen months, there is considerable confusion in the public mind, as well as among naval officers, as to whether or not the graduates are actually instructed in flying. The answer is "No," and for the reasons explained above. It might be well, however, to quote a naval aviator who has been flying for some fifteen years, to the effect that the principles governing the course at the Academy are sound; that at this period of his career the future naval aviator should have all the training possible in ground school subjects before learning

to fly, for once he is qualified to handle the "stick" it is only human nature that he will care less and less for navigation, radio, and gunnery. Experience in automobile driving seems to bear this out, for after one learns to drive a car one becomes possessed of the joy of driving and cares proportionately less about the lubrication, upkeep, and maintenance. It is also well to recall that the time actually spent in the air by an aviator in naval aviation is not more than five per cent of his naval aviation duties. These points are not emphasized to belittle the flying skill required of the pilot, but to bring out more clearly the reasons why the Naval Academy course stops short of dual instruction.

The Superintendent of the Naval Academy has emphasized the point that since the flight surgeon's examination, together with inaptitude for flying, makes it possible for only one out of every three graduates to qualify later as naval aviator, it is *doubly* important that the other two classmates on the bridge get as much training in aviation as practicable.

Our naval forbears received their first training on blue waters in the bitter school of experience and oftentimes in battle. Within the walls of the Naval Academy today we see everywhere around us constant reminders which bear silent witness of the efficacy of that school.

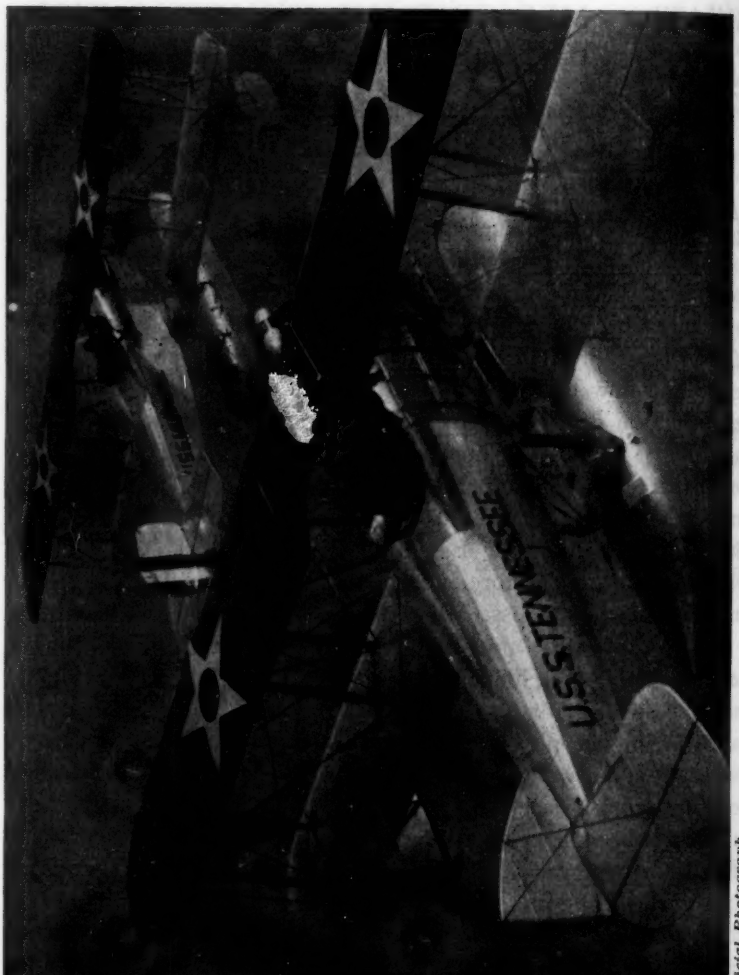
Throughout the years, the mission for training officers has remained the same proficiency in "ship handling"; and this mission remains the same whether the ship be upon the sea, below the sea, or above the sea.

AVIATION MEDICINE AND ITS APPLICATION TO THE NAVAL SERVICE

By Lieutenant Commander Robert G. Davis, (M. C.), U. S. Navy

AVIATION has become a reality. It has passed the experimental stage of practicability, and although in the infantile stage of a great future development, its possibilities are recognized. Man's physiological compensations are meeting the new demands of a daily routine. Medicine has ever kept abreast of man's activities, successfully coping with the problems presented and now the airplane presents a field of unusual demands, requiring the most extensive application of its art in increasing the safety factor. The human organism must be generously endowed with a finely balanced nervous equipment to surmount the stresses of a rapid transit through varying degrees of rarefied air and barometric pressure. Latent defects of the apparently normal will be brought to the fore and gravity will rule, resulting in death and great monetary loss.

The success of the most highly perfected plane design is wholly dependent upon the human element at the controls, and aviation medicine springs forth to assume its responsibilities. The application of higher physical standards early in the war produced immediate improvement in the amazing ninety per cent of crashes resulting from a carelessly selected personnel. New possibilities in aviation became evident, flights were more accurate, the range of activities increased, and life extended from hours to years. Each government was quick to sense the value of these observations and established research laboratories in charge of the highest medical skill obtainable for intensive studies of the demands made by aviation upon the circulatory and nervous systems. The progress of today is the result of the early lessons so dearly learned. The Army laboratory has become a permanent service school and the Navy has incorporated the department of aviation medicine in its medical school curriculum.



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U. O. Planes in Flight

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It is universally recognized today that only the physically fit should fly, but special factors, such as temperament, reaction time, and mental development must be stressed, although these factors may assume a minor degree of importance in the physically fit for less hazardous fields of endeavor. With the rapid expansion of non-military flying, the civilian physician can render a valuable service in this new branch of preventive medicine. A few of the more practicable essentials of the physical and psychological examination will be mentioned in the brief scope of this paper.

A searching psycho-analysis must be made to determine the trends and potentialities and any hidden defects, either inherited or acquired, that may become magnified and motivate conduct from the insidious fatigue experienced in rarefied air. Fainting, dizziness, acute mania, and even epilepsy may first become manifest in the air. Reactions both muscular and visual must be automatic to surroundings, supported by a resolute judgment and decision. Delayed reactions mean disaster in aviation. The temperament should be cheerful, stable, and self-reliant; the volition, energetic and controlled with a good tenacity of purpose. A keen desire to fly is the prime requisite. The train of thought must not be diverted by objecting relatives, financial worries, or other unsolved conflicts.

Pertaining to the physical side, the eyes are of first importance. They must not only present a minimum visual acuity of 20/20, but a perfect balance of each muscle, allowing the maximum field of binocular vision with no tendencies to diplopia or nystagmus. The phorometer may reveal hidden and spasmodic defects easily influenced by a lowered oxygen fatigue. The angles of convergence and divergence must not be restricted and all coordinated movements prompt and free from lagging. The sound reception and conduction mechanisms of the ears are carefully tested. The drums must be free from wax, inflammations, and scarring; the eustachian tubes potent for equalizing pressures during rapid descents. The balance sense is tested through each semicircular canal by the rotational chair, and the resulting nystagmus and falling manifestations compared with the normal. The nasal passages must be free, as altitude greatly aggravates any tendencies to obstruction. Mouth breathing produces pyorrhœa, gingivitis, tonsilitis, and headaches from defective sinus drainage. There must be free breathing from a healthy respiratory tract. Correct

U. O. Planes in Flight
Official Photograph

respiration is manifested by an upward movement of the lower ribs with the diaphragm contraction and a good vital capacity is dependent upon a complete muscular emptying. Flack of the Royal Air Force has defined the physically fit as one who in response to physical effort is able to maintain his "ventillation capacity" at a high level during the period of performance. He can withstand a much less partial pressure of oxygen than the unfit before symptoms of respiratory instability and circulatory embarrassment appear. This is most important to the aviator who must make rapid adjustments in rarefied air.

The optimum circulatory efficiency is found in a pulse of seventy-two, not markedly increased by exercise and followed by a prompt return to normal. The pulse pressure should not exceed forty to fifty mm. of mercury with a well-sustained diastolic pressure. A continued fast pulse points to a general physiological insufficiency not sought in aviation. High blood and pulse pressures are apt to break under severe physical and nervous strains; low pressures lack stamina and tend to fainting. Myocardial changes should be excluded by the electro-cardiograph and any vessel changes carefully evaluated. Arterio-sclerosis from alcohol or lues must be excluded. The Schneider index affords a rapid and comprehensive method of determining the circulatory efficiency not only for the acceptance examination, but during the pilot's performances. It is dependent upon six factors: (1) the reclining pulse rate; (2) the standing pulse rate; (3) the difference between the reclining and standing pulse rates; (4) the difference between the standing pulse rate and the rate following a standard exercise; (5) the time for the pulse to return to the standing rate after the standard exercise; (6) the difference between the reclining and standing systolic pressures. From a large number of observations, an arbitrary value of minus three to plus three has been given to each varying factor with a maximum plus total of eighteen. A score of seven is unsatisfactory, while fourteen to eighteen is excellent. Great interest is shown in an operating squadron when the weekly scores are posted.

A new sense is developed in aviation, namely, the "flying sense," dependent upon vision, hearing, balance, tactile, and deep muscle sense. All are brought into action at the most critical part of the flight called the stalling point, which terminates the flying speed. Occurring in the air, a gravity drop results requiring a dive of

several hundred feet to again gain control, proving fatal should it occur in leveling off too high in approaching for a landing. The deep muscle sense and the wind on the cheeks differentiate between the faint and strong controls, the light and firm seat pressures in acquainting the pilot with the "feel of his plane." Forced landings over unfamiliar ground require all his intuition and training supported by a background of physical and nervous equipment that will not fail. The flying sense is only developed and retained by frequent flying stopping short of fatigue when perceptions become dulled and reactions slowed.

Continued flying without proper intervals of rest produces a condition of lowered nervous efficiency known as staleness. It may appear as a cardio-respiratory type with a rapid, shallow breathing and cold extremities, accompanied by a rapid and weakened pulse; a nervous type showing poor muscular control, exaggerated reflexes, fine tremors of hands, tongue, and eyelids, nightmares, and insomnia; a muscular type presenting rheumatic pains in tender and flabby muscles. Any of these symptoms occurring in an aviator call for an immediate rest, corrective dietetic measures, and a change of environment. Recovery is usually complete in a few days and the deteriorating flyer is restored to his former degree of safety.

No phase of a medical officer's activities in the military service requires such a close observation of personnel as aviation presents to the flight surgeon. His responsibilities have only begun after the flyers are accepted and trained. To detect the earliest signs of insidious deterioration, he must know the pilots intimately, observe them daily on the ground or in the air and be conversant with their habits while off duty. Frequent conferences are held for the discussion of general health principles, including the values of regular sleep, good food, recreation, and abstinence from alcohol. The latter predisposes to fatigue with dulled vision and muscle sense, accompanied by a careless abandon in the air. Flying with one wing low, rough landings, etc., are often due to wax in the ears or a faulty depth perception preventing a proper appreciation of balance and the landing terrain. Hasty checks in the field dispensary will reveal the causes before the defects have become known to the pilot. He is cooperative and interested in all that is done and will often ask to have his circulatory index compared

with previous scores, realizing that his greatest safety factor is physical fitness.

The greatest psychological factor in getting close to a pilot is flying with him or his squadron, experiencing his emotions and strains, as well as sharing in his enthusiasm. An unusual comradeship exists between personnel undergoing the same hazards and on short or extended flights the flight surgeon renders a subconscious sense of security and is present to detect the first signs of the physical or psychological abnormal.

Candidates for aviation in the naval service are selected from young volunteers throughout the fleet, preferably in their twenties, who have completed two years of general sea duty. These young officers are given the two or three hours searching physical and psychological examination by a flight surgeon who has had special training in aviation medicine and is armed with the special examining equipment. After approval by the Navy Department, the candidate is transferred to the training school at Pensacola, Florida, to undergo an intensive six-week course in the ground school, mastering the mechanics of flight, radio, engines, and plane construction. If successful in this part of his training, he is placed in the hands of specially selected instructors for training in the air. After ten hours of dual instruction, he should be able to solo and advance to the various types of planes and maneuvers used in the naval service. Graduation with the coveted wings insignia occurs only after a special board has passed favorably upon every phase of his performances.

The flying activities of the Navy are varied as to type of plane and duty required. Bombing, scouting, torpedoing, observing and combat maneuvers are performed by both land and sea planes flown under trying and often most adverse weather conditions. Aviation has now become an important arm of the fleet, accompanying it on short or extended cruises. The small combat planes carry out daily battle maneuvers and all pilots must be trained in gunnery and acrobatic exercises. The smaller hydroplanes are hurled from the catapults of the cruisers and battleships to hover over the targets beyond the horizon, reporting by radio the result of each shot from the long range guns. The twin motored hydroplanes, manned by a crew of seven men, are used for bombing and for towing target sleeves for the anti-aircraft batteries. Photographic and observers' planes are high above both land and sea

maneuvers, while stationed below in the midst of surface activities are the flight surgeons, ready for immediate dispatch to the scene of an accident, either by plane, ship, or motor ambulance. Motor failures are the constant concern of all planes, particularly those of land planes flying over water and even hydroplanes are quickly damaged in heavy seas. Each plane is provided with well equipped first-aid packages protected by water tight casings and all the personnel are thoroughly trained in their use. Speed boats and ambulances supplied with first-aid appliances and tools for clearing away wreckage are manned during flying hours and ready for instant dispatch.

Every possible safeguard is offered the aviator to preserve his faculties and lessen trauma should accident occur. Electrically heated suits combat the lowered temperatures of altitude, parachutes must be worn, well selected goggles assure unobstructed vision, ear protectors shut out the excessive noise from the motors, and surrounding fusilage surfaces are well padded to minimize the danger of skull fractures, or less serious injuries. For the higher altitude flights, oxygen breathing equipments are supplied as few men can continue nose breathing above 10,000 to 12,000 feet and must resort to an increased rate of mouth breathing to assist the compensatory physiological changes. More and more the former predominant thought of the mechanical efficiency of the plane is being transferred to the conservation of the pilot.

The flying line of the Navy may be interchangeable from land to sea. Wheels and pontoons are readily changed for the types of duty desired. During the past two years aircraft have operated with the fleet in the West Indies, Panama, Hawaii, and Australia. Additional facilities may be acquired with camps established ashore containing field hangars, repair shops, and dispensaries. Here aviation medicine expands to include camp hygiene and sanitation, and aboard ship it also covers every phase of preventive medicine. Expeditions increase the pilot's strain with the rapid changes from temperate to tropical climates and operating over unfamiliar and very hazardous terrain. The planes require extra care and more rigid inspections depending on ships and mobile shops for upkeep and repairs.

Too much praise cannot be given the enlisted personnel who are the backbone of aviation. They receive special training in an aviation mechanics school, simulating the officers' ground school, becom-

ing thoroughly familiar with construction, repairs, and radio. Upon them largely depends the mechanical efficiency of the plane and no weather or other circumstances are too adverse to dampen their zeal and enthusiasm when an engine needs replacing or other repairs demand their services. Each plane has its flying crew and many enlisted men who show unusual dependability are given air instruction and become excellent pilots. A remarkable *esprit de corps* exists between the officers and men and in every accident the first thought is of the other fellow.

The airplane carrier has widely extended the operations of air craft with the fleet and soon the *Saratoga* and *Lexington* will be added, whose huge flying decks will further facilitate the simulating of shore landing conditions at sea. The pioneer deck landing training has been intensively carried on aboard the *Langley* at sea and to date no loss of life has occurred. It is a strange sight to witness land planes darting about in mid ocean serving as the eyes of the fleet and safely returning to the flying deck. During the search for the lost trans-Pacific hydroplane, many thousands of miles were flown without a single accident to plane or personnel.

Airplane accidents and crashes are carefully analyzed and from each a lesson is sought. Each defective factor is recorded in its respective per cent column to further stimulate the eradication of danger elements. The hazards of operation include bad landings, spins, side slips, collisions in air, taxi-ing, weather conditions, glassy water, fire, gasoline exhaustion, bad take-offs, skidding, and poor piloting. Structural failures include pontoon, landing gear, rib, and hull. Arresting gear and catapults further add to the operating problems. The hazards of operations have been increased the past year due to a wider geographical distribution of activities with increased difficulties of plane upkeep, yet the crashes due to pilots have shown substantial improvement and the percentage from all causes a remarkable decrease per flight and per flying hour.

Pilotage as during the war still remains the leading primary cause of all crashes, but a fifty per cent improvement during the past six years stands as a convincing endorsement of the value of aviation medicine. This new branch of preventive medicine has unlimited possibilities and is destined to play an increasing rôle of importance contributing to a safer aviation.

The extensive employment of aircraft in civilian activities brings the medical aspects to the door of each physician, who can perform a valuable service for the pilot after appreciating the unusual demands made upon him and the "physically fit plus" factors required. May we all be ever ready to apply the professional wrench to the weakening or wearing organism, serving the pilot as "guide, philosopher and friend."

THE SPOILS OF WAR

By Commander John Rodgers, U. S. Navy

ON RETURNING to the United States in September of last year, after floating on the Pacific more or less peacefully for a period of nine days, I found the country in a state of turmoil. I had the impression of being thrown into the midst of a great "battle royal," where everybody was fighting everybody else, each for himself.

It appeared at first that the bone of contention was whether or not aviation of this country should be advanced, but on closer scrutiny it became plain that all participants in the fight were of one mind on that subject, all agreeing to the affirmative. What the fight was about was how this improvement should be accomplished and there were almost as many methods proposed as there were contestants and, so it seemed to me, almost as many contestants as there were people in the United States.

The principal classes engaged were the army aviators; the navy aviators; the other officers of the Army; the other officers of the Navy; civilian aviators; the aircraft manufacturers; the newspapers, and the general public. The main event was being held at the Capitol building with Dwight W. Morrow and eight other presumably disinterested distinguished gentlemen acting as judges.

Ninety-nine persons, (one of whom was myself) representing all the various classes of contestants, appeared as witnesses before the judges and their statements indelibly written down and printed in a book almost six inches thick will be available for posterity to read, no doubt with amusement, in the light of future developments.

After four weeks of taking testimony, the judges closed their doors for deliberation. It is my opinion, although I never saw behind the doors, that another "battle royal" took place among the judges. Their report announced a draw and recommended that the spoils be divided equally among all the contestants except the newspapers, for there was nothing sensational in the report.

Of course, nearly all contestants were disappointed. The aviators were disgruntled because they did not get more and the old line were irritated because the aviators got so much; the aircraft manufacturers and civilian fliers could not see where things were improved for them, etc., etc., but as time goes on, no matter what class of contestant he belongs to, one cannot help realizing more and more the constructive and real value of the report.

The Morrow Board could only recommend to the President and he, in turn, to Congress. It remained for Congress to say, finally, whether the prize should be awarded or not. It is now approximately a year since the smoke of battle has cleared away and a good time to take stock of the spoils.

Here is a list of the twelve recommendations of the Morrow Board for the Navy, each accompanied by a statement showing what legislation or administrative action has been taken to carry it out.

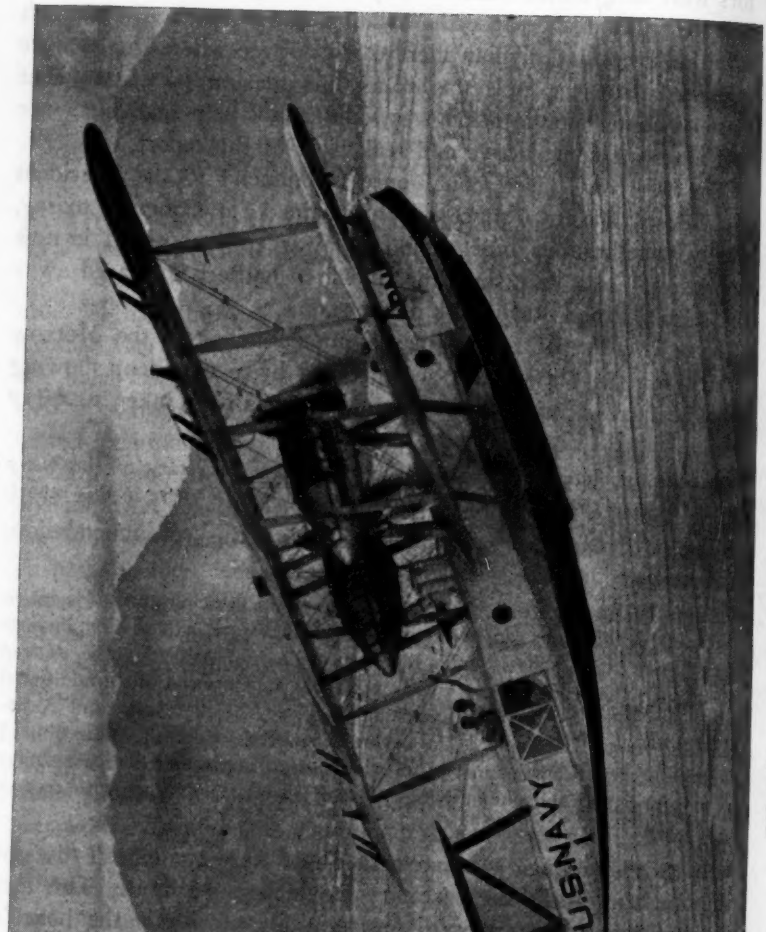
1. The appointment of an additional Assistant Secretary of the Navy under the conditions and for the purpose discussed elsewhere in this report.

The Morrow Board, in connection with this recommendation, makes the following remarks:

In suggesting remedies we rest upon the sound principle that no solution proposed at this time can be lasting. It is, therefore, of the first importance to lay the emphasis upon the best method of achieving the desired result. To that end we rely chiefly upon the appointment of an additional Assistant Secretary of War, Assistant Secretary of the Navy, and Assistant Secretary of Commerce, to devote themselves under the discretion of their respective heads, primarily to aviation and jointly to coordinate so far as may be practicable the activities of their three departments with respect to aviation.

Notwithstanding this statement, there were some who thought that such an Assistant Secretary would be superflous. The fact is, that this triumvirate of Assistant Secretaries is the board's answer to those who demanded better coordination between the three branches of aviation. It does not, however, disturb the established organization.

Besides cooperating with the Assistant Secretaries of War and Commerce, for the air, the Assistant Secretary of the Navy will have to coordinate for the Secretary the various aeronautical interests within the Navy Department. He will have to nourish, but not overfeed, the aircraft industries, and have to get from Congress sufficient authorizations and monies to keep the Navy's



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aviation up to a high standard. In all these matters he will act for the Secretary.

Dr. E. P. Warner, late professor of aeronautics at the Massachusetts Institute of Technology, and a leading authority on aerodynamics in this country, has been chosen to fill this billet, and no taxpayer need have cause to worry that this valuable young man will not earn every cent of the munificent $7,500 salary which the government pays him. Judging by his record, it is expected that before long he will, while retaining his place as a leader in the science of aerodynamics, occupy an equally high position in the all-embracing science of "Bossing the job."

2. The carrying as extra numbers, and at their own request, of officers (line or staff) of the grade of captain, commander, and lieutenant commander, who have specialized in aviation so long as to jeopardize their selection for the next higher grade and thus insure such promotion as would be otherwise due.

Legislation has been passed which protects those coming up for selection for captain and commander against being passed over because of lack of experience in general duties. Also, the Bureau of Navigation and the Bureau of Aeronautics have announced the policy to insist on all aviators having enough sea duty in the future to qualify them in the eyes of the selection board for promotion.

3. The giving of temporary rank as captain, commander or lieutenant commander to any officer of a junior grade when he is detailed to duty requiring specialization in aviation and for which the higher rank is proper.

The principle of giving temporary rank to those specially qualified to perform a temporary duty and then, at the conclusion of this duty, requiring them to return to their original position in the line of promotion, is one which has long been recognized as a great advantage. Thus, in all wars, practically all regular officers are given temporary rank so that they may be used to command the officers brought into the service from the reserve. In our Navy, in time of peace, and with the authority of the law, we take advantage of this principle by promoting especially qualified officers from rear admiral to vice admiral and admiral, regardless of their standing on the Navy list, for the command of fleets. Also, specially qualified officers of lower rank than rear admiral are promoted to rear admiral for the purpose of becoming Chiefs of Bureaus in the Navy Department.

The object of this recommendation was to allow the utilization of the experience of junior officers who had long specialized in

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aviation, to temporarily take precedence in flying organizations over older officers with limited aviation experience. As the idea did not meet with much support from anyone, because of the anticipated difficulties which always result from preferment, Congress dropped the matter.

4. The maintenance of flight pay as at present, but with the conditions and in connection with the insurance study recommended for the Army.

Flight pay is still allowed but there has been no legislation in regard to insurance. The insurance proposition is unquestionably a fair one for dependents, but should be extended equally to all officers in the service, for an aviator when killed in line of duty is no more dead than a dead deck officer, nor is his widow any hungrier. But what about the aviator himself? According to statistics he has a 49.5 to 1 better chance of realizing on his insurance for his widow than the deck officer, but no better chance to enjoy it. Therefore, insurance can hardly be considered as a full substitute for flight pay. The ratio 49.5 to 1 is arrived at by averaging the rates per thousand of fatal accidents from 1921 to 1924 inclusive. The 1925 rate is not yet available.

5. Additional plans for, and suitable provisions for the training of reserves.

The question of training reserves is an important one. As fighting machines airplanes have one unquestionably great advantage over ships. Airplanes can be built, if we know exactly the type we want, in a comparatively short time after war has been declared; ships cannot. In order to profit by this advantage, however, there must be the nucleus of a readily expandable aircraft industry and a body of trained aviators sufficiently large to man the machines built immediately after the outbreak of war. There has been no legislation resulting directly from this recommendation but the regular Navy appropriation for this purpose is approximately $902,000 and more attention is being paid to the subject in the department. The Navy maintains training schools at Squantum, Massachusetts; Sand Point, Washington; Rockaway Beach, New York and Great Lakes, Illinois. Students are sent to one of these schools until proficient in flying, then sent to Hampton Roads or San Diego for advanced training. When this is completed the aviators are ordered to duty with either the aircraft squadrons, battle fleet, or scouting fleet for two weeks each year so that many have their annual training aboard ship.

The Navy plans to have, eventually, twelve reserve squadrons, fully manned and equipped and ready for immediate war.

6. To the end that naval aviators should have the opportunity to present naval aviation problems to those responsible for the shaping of the policies and for the handling of the personnel of the Navy, we recommend that representation should be given naval aviators in details in both the office of the Chief of Naval Operations and the Bureau of Navigation. We recognize that there are fundamental distinctions between the organization of the high command in the Army and the Navy. With a proper spirit of cooperation, however, we feel that the naval high command will find real opportunity to utilize the special knowledge and counsel of the naval aviator. This is analagous to the infiltration of air corps officers into the general staff of the Army. Here, as in the Army, the particular men chosen must be of the temper of mind to appreciate not only the special needs of aviation, but the needs of the Navy as a whole.

In accordance with this recommendation, we now have two naval aviators detailed in the office of the Chief of the Naval Operations; two in the Bureau of Navigation; one in the Bureau of Engineering, and on the same principle there are five detailed to the Naval Academy.

I believe that the presence of aviators under the direct authority of the other chiefs of bureaus will be found a great advantage, and in time relieve the chief of the Bureau of Aeronautics from the virtual responsibility in matters in which he has neither legal responsibility nor authority. It is my firm opinion that the time is rapidly approaching when aviation can be centralized under the Secretary of the Navy like the other branches of the Navy. The Bureau of Aeronautics will always be required to supply aeronautical material and information.

7. Selections for command or for general line duty on air craft carriers and tenders, or for command of flying schools, or for other important duties requiring immediate command of flying activities should be confined to those officers who, while otherwise qualified, are also naval aviators; and such a policy should be followed as will provide a sufficient body of officers thus doubly qualified.

In connection with this recommendation, the board says,

There is justification, of course, for the contention of the higher officers that to be competent to command ships of fleets, an officer must have sea experience. On the other hand, we feel that there should be a recognition of the principle that an officer with both sea and air experience should, other things being equal, be better fitted for command than an officer who has had sea experience only. As in the Army we find the

direct command of flying men by non-flying officers is objected to. There appears to us justice in this contention.

Congress was so impressed with the importance of carrying out this recommendation that they enacted it into a definite law, although normally it would have been a matter more properly left to administration. I feel sure this law is the result, not of advice of aviators, but of the popular conviction that aviators should be commanded by aviators, and of the belief that many officers of the Navy did not fully realize the importance of this principle. Ever since the Spanish War it has been held by our service that men to qualify for command of ships must not only have spent long years at sea, but have an intimate working knowledge, gained by experience, of the mechanical contrivances on board and the interior administration of those ships. The principle should apply equally to command of flying units up to and including command of aircraft squadrons. Hence, high commands in aviation are now being given to those who have had aviation experience, either in the course of their careers or as special preparation to taking up this command. Recently, two captains were qualified as naval aviators at Pensacola, and three others as observers.

The law defines a "naval aviator" as one who has completed the prescribed course and flown alone for seventy-five hours and been in the air 200 hours; and a "naval observer" as one who has completed the prescribed course and been in the air for 100 hours.

The law also requires that air stations be commanded by naval aviators and aircraft carriers by naval aviators or naval observers who are otherwise qualified.

8. An aviator assigned to general line duty for purposes of qualification in command should be disassociated from aviation to the minimum extent.

There are now detailed to each of eighteen capital ships and eight scout cruisers, two or more aviators who, in addition to their aviation duties, stand watch underway like the other officers of their rank aboard ship and some are also given additional duties in the various departments of the ship. The scheme is working out satisfactorily and gives great promise, indicating that in accordance with the hope of the Morrow Board, the Navy is developing officers doubly qualified for ship and aviation duties.

9. Junior officers in aviation who, for any reason, have not had the required sea duty should have that duty before being examined for promotion.

As already stated, this is a matter of administration in the Bureau of Navigation and is being attended to.

10. Special insignia for aviators should be retained, and a special decoration for extraordinary heroism or achievement in aviation should be provided, as in the case of the Army.

No action was taken on the tenth recommendation because there are already authorized sufficient number of navy medals to cover the case.

11. A study should be made to secure a method through which sufficiently attractive careers may be provided in order to retain qualified technical officers in naval aeronautic design and construction.

The required study of this recommendation has been made by a special board authorized by the Secretary of the Navy to consider matters pertaining to aviation personnel. As a result of this board's study, a bill was referred to the Naval Affairs Committee, authorizing naval constructors and assistant constructors of the rank of lieutenant and above, who have specialized in aviation so long as to jeopardize their chances for selection in their own corps, to transfer to the line of the Navy in the status for "engineering duty only." This bill also provided that assistant naval constructors of the rank of lieutenant and lieutenant (j.g.) be given opportunity to qualify for general line duties, and then transfer to the line of the Navy. This bill, however, did not meet with the favor of those affected, and was not put through. No further suggestions have been made, nor does any action on this recommendation seem necessary as it is not clear that naval constructors are suffering because of their specialization in aviation.

12. A study should be made of the desirability of increasing the use of enlisted men as pilots in naval aviation duty.

This is, of course, a matter of administration purely, and plans have been made to form a squadron of fighting planes manned by enlisted men picked from the present enlisted pilots and trained in the battle fleet for this special type of work.

The Five-Year Building Program

The foregoing twelve recommendations include all that were made by the Morrow Board especially for the Navy, but the Navy profited most from the following recommendation made for the benefit of the aircraft industry: "The adoption of a policy of continuity in orders and standard rate of replacement."

Long before the excitement last fall and before the Morrow Board had been thought of, the Bureau of Aeronautics prepared and the General Board approved, a general program by which at the end of five years the Navy would have all the planes called for in the peace-war plans with one-third additional for replacements. Thus, when Congress called upon the Navy for a policy of continuity in orders and a standard rate of replacement, Admiral Moffett had only to produce this plan. With some shaving down it was authorized *in toto* so that if Congress provides the necessary $85,000,000 during the next five years, in 1931 the Navy will have 1,000 planes, 667 in operation and 333 in reserve, for replacements. In addition to this, Congress also authorized two great dirigibles of 6,000,000 cubic feet capacity, of a type suitable for use as adjuncts to the fleet and one small experimental metal-clad airship. So far, however, no additional money has been appropriated to carry out the five-year building program. Consequently, next year will be the first year of the program.

Conclusion

In conclusion, it may be fairly stated that the Navy's share of the spoils of the battle royal last fall, in spite of criticisms to the contrary, has resulted in the development of a more satisfactory situation. The interest of the Navy as a whole has been advanced in direct ratio to the advancement of aviation. There has been brought about a better understanding, and what appeared to be conflicting interests are merged into one interest—the development of the Navy as a whole.

For these results the Morrow Board is primarily responsible and the country, as well as the Navy, owes to it and to the naval committees of Congress, a debt of gratitude for the work performed and the sagacity displayed in the handling of a most difficult situation.

The navy seamen, subseamen, air-seamen, and landsmen, are, however, warned to keep up the good work, remembering this statement of the Morrow Board—

> In suggesting remedies we rest upon the sound principle that no solution proposed at this time can be lasting.

NAVAL COMMUNICATIONS

By Captain Ridley McLean, U. S. Navy, Director
Naval Communications

THE PEOPLE of the United States know too little about our Navy. As beneficiaries of this enormous federal activity, upon whose interest its maintenance depends, the more that our citizens know of their Navy the more certainly will it be maintained in condition to fulfill its purpose when emergency arises.

It has frequently been stated that the Navy is a large business organization of which the people of the United States are the stockholders and Congress the board of directors. To my mind, a happier analogy is a comparison of the Navy to a levee built and maintained by the inhabitants of a region for their mutual protection against occasional abnormal flood waters. By this means, if the levee has been properly maintained, when the waters rise they are retained in their normal course, and under its very banks the inhabitants may continue undisturbed in their usual pursuits. If during periods of low water the levee has not been adequately maintained, an abnormal rise of the river may cause a break, inundate vast areas and destroy untold lives and property.

To those living under the shadow of the levee, no argument and little imagination are necessary to emphasize the importance of maintaining it in perfect condition. Anyone who lives near it realizes that flood waters will come sooner or later and that unless the levee is so maintained as to meet the emergency then presented, the money and labor which have been expended in maintaining this semblance of protection are worse than wasted: reliance upon this false security would result in even greater loss of life and property than had the levee never been constructed. A levee which is inadequate to protect against the maximum requirements, or one which through false economy has not been maintained in the state of efficiency considered necessary by the skilled engineers in charge, may withstand minor rises of the river and it may

U. S. S. "PENNSYLVANIA"

Photo by Spence Airplane Photos

thereby delay the fatal day of collapse, but the day of reckoning must come when it will fail and the devastation will then be greater because of reliance upon its protection.

Though these facts are appreciated by those who live near enough to see the actual protection which is afforded them daily by the levee, this is not always the case with those who, though equally under its protection, live many miles from the banks of the river. It is often difficult to impress upon such persons the fact that the levee affords them exactly the same protection, and its efficient condition is in all respects as important to them as to those who live nearer. Such people are prone to economize on the levee at the expense of projects of more immediate apparent desirability or convenience.

Again, a certain human trait frequently inclines us to disregard technical advice and to form our own opinion on technical questions, even though our lives and property may be irrevocably involved. This is probably because even technical opinion is not infallible and the innate gamblers' instinct in human nature may suggest to unwilling contributors to such vast insurance schemes as the maintenance either of a Navy or of a levee, that in their opinion the work recommended may not be absolutely essential and they are willing to "take a chance." Such is the most probable reason for difficulties in obtaining appropriations for rectifying weaknesses which are apparent only to the trained eye of the engineers in charge of the levee; such, similarly, are the reasons for inaction or inadequate action on the part of the people in strengthening weak points in the Navy which are apparent only to the trained eye of the naval student.

This analogy emphasizes the necessity for a broad understanding on the part of every person in the land of the function and requirements of the Navy. These requirements can be better comprehended by a detailed knowledge of the interior activities of our first line of defense. Of these activities, one of the most important and one of the most rapidly growing is that of naval communications. It is the object of this article to acquaint the reader with the function of naval communications as a military requirement and of the services which it daily renders to the nation.

In times of peace we think in terms of peace. In speaking of naval communications, the layman is apt to visualize the commu-

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nication system of the Navy merely as a convenience or even as a luxury. He will admit that it provides means for quick communication with ships of the Navy in any part of the world, but he may doubt the necessity for such communications without even giving a thought to war. It may be stated initially that if peace-time communications were the primary function of the naval communication service, the present extensive system would not exist. It would be quite possible to perform this limited function by the use of commercial facilities, if this were all there were to the problem. It must, therefore, be clearly recognized in the very beginning that "communications" is a war requirement. The naval communication system is designed for its war-time use exactly as are vessels of the Navy themselves; every change made in the system is weighed in that balance and all methods and all training are based on their value for war.

The broad activities of a ship operating in the fleet are classified under three headings—gunnery, engineering and communications. It would be a brave man who dared select any one of these three as being of greater importance than the others in naval operations. Command is exercised only through the ability to communicate. This is true whether the command consists of one ship or a hundred. With one ship the captain exercises his command through word of mouth, the fundamental means of communication between individuals. The moment this means of communication becomes inadequate, as for example, when an officer is assigned to command two or more ships, then mechanical means must be enlisted to enable him to communicate information and orders to the ships of his command and to enable them to transmit information to him and to each other. Except for his ability to communicate his desires to his subordinates and the ability of subordinates to communicate information and intelligence to him, an admiral would revert to the status of a passenger. Communication is, therefore, the agency which renders command possible. It binds together the units of which the Navy or the fleet is composed. Through communications, what would otherwise be merely an assemblage of ships each following the dictates of a different mind, is transformed into a cohesive unit of which each ship forms a component part, all operating in unison in executing the plans of the commander-in-chief. This in short explains the function and the military necessity for a naval communication

system. If communications are slow or limited in range, command is correspondingly handicapped; if quick and unlimited in range, the commander-in-chief can exercise command over a whole ocean.

It must not be understood that communications is a recently discovered requirement of war. What has been stated about communications being an essential for the exercise of command was true in the beginning, is now, and always will be. Its importance has ever been recognized in war operations. Before the invention of the telegraph, forces operating on shore communicated through the slow means of couriers, or, within short range, by signals. With the advent of the telegraph and telephone, these methods were adopted by military forces and notwithstanding the complication of a net-work of wires leading up to the front lines these means of expediting communication were seized upon with avidity. The telegraph and telephone were obviously ill adapted for communication between ships afloat or between ships and shore; therefore, until recent years the dependence of flag officers afloat has rested upon signals, thereby practically limiting his exercise of command during active operations to ships within visual signal distance. Military history is pregnant with disastrous failures of well conceived plans which resulted from the inability of the commander to obtain information from his subordinates or to deliver orders seasonably to subdivisions of his command. The more perfectly these functions can be performed by our Navy in war, the more formidable will be the fighting force with which we will oppose the enemy. Our goal must therefore be to provide our naval forces with the most efficient communications that the developments of science render possible.

In war all features are comparative. In the days of crude communications, both belligerents were equally handicapped. The importance of providing the most efficient communications possible was recognized, but so long as the two sides were approximately equal in this feature, no advantage in this respect accrued to either force. The same identical situation obtained in regard to motive power and offensive weapons. However ineffective would be the ships and guns used by John Paul Jones or Farragut or Dewey, if pitted against modern vessels, the facts are that they were opposed to ships and guns of their own date. The value of better ships and better guns was recognized, but they were not

to be had. In these features, we were measurably equal to the enemy. Opposing material being roughly equal, it remained for the battles to be decided by human qualities. History shows that however closely guarded may be the secret, superiority in material cannot long be maintained by either side. We find material features such as ships, engines, guns, torpedoes, armor, or communication equipment, in any given period of history, approximately equal in the navies of those countries who were willing to stand the expense of keeping their navy modernized. Communications is a feature of military importance comparable to gunnery and engineering. Unless the Navy in all of these features is maintained approximately equal to our possible enemy, it will enter war initially handicapped, and this is true whether we consider ships, guns, engines, or communication apparatus. The people of the United States have the material of the Navy in their hands; it is a question of dollars and cents; skill in handling this material is in the hands of their servants—the officers and enlisted personnel of the Navy. Given equally efficient material, the people of the United States have a right to expect skill on the part of the personnel of the Navy sufficient to turn the scales of battle to victory; it would be unreasonable however for the people to send this personnel into a death struggle demanding a degree of skill so much superior to that of the enemy as to overcome an initial handicap in material. It is for the people to decide whether the Navy is to be maintained in the condition considered adequate by their experienced students of naval warfare.

As compared to former days, the improvements in naval communications have in recent years been revolutionary; radio has provided a means peculiarly adaptable to forces afloat, by which means the ships and the area that may now be commanded by one officer are almost unlimited. But, notwithstanding this progress, the fundamental question as to adequacy of communications comes back to a comparison with the communications of our possible enemy. Though some minor nations may, for reasons of economy, permit their apparatus to become obsolescent, we may rely with confidence upon the navy of a formidable enemy being supplied with the most modern apparatus which the state of the art can provide. It follows that our own Navy must be maintained in the most efficient possible condition, both as to communication apparatus, personnel, and systematic administration. Herein lies

the answer to the question—"Why maintain an extensive communication system in peace?" It must be maintained and perfected during peace so that it may at all times be in readiness for the requirements of war; it must be kept modernized so that we may be at least equal in this vital activity to any possible enemy. Though in war the naval communication system would be amplified by existing commercial stations, it is maintained in skeleton form during peace, with certain individual stations at full strength, so that should war be declared against us without warning we would be able to communicate with vessels both of our Navy and of our merchant marine anywhere in the seven seas. The mission of the naval communication system is to furnish, from the very moment war is declared, quick, reliable and when necessary, secret communication between units of the Navy, both afloat and ashore. To this end, the system is established, trained, and perfected during peace by performing as nearly as possible the exact functions which will be required of it in war.

Lest the above be considered academic and general, I shall try to picture the problem concretely. In war, it is essential that the Navy, the fleet, or a squadron, be in fact a unit, each ship of which conforms to the mandates of the commander-in-chief and carries out its rôle in executing his general plan of operations; otherwise, the maximum results from this force would not be forthcoming. In order to command an assemblage of vessels, communications must be provided between the commander and every component of his force. What are these components of the Navy? First, we think of the Navy Department and of the commander-in-chief of the fleet; next, the major units of the fleet, such as the battle fleet, scouting fleet, destroyer force, submarine force, etc.; next, units of the fleet on detached service; then, individual ships scattered up and down the coasts or in remote parts of the world; then, we think of naval bases, navy yards, arsenals and activities supplying material upon which operations of the fleet depend. To knit the Navy into a unit commanded by one mind, it is manifest that its commander-in-chief must be able to convey his orders and receive information and intelligence from each of these component parts; furthermore, in order to insure maximum cooperation, each of these component parts must be able to communicate freely with any other.

Again, consider the commander-in-chief of the fleet; to command that fleet, he must be provided with quick communications to each unit and to each of the hundreds of ships composing it; he must moreover be able to communicate with naval activities on shore upon which he must depend for supplies and information and each of his subordinates must in turn be able to communicate with him, with their immediate superior in line of command, with their subordinates and with the various activities on shore. These various units with which he must be in communication may be on the surface, under the surface, or in the air—the requirements still obtain, communication with them must be provided if we are to go into war on measurable equality with a possible enemy.

Except for the bonds of mutual interest which establish a fraternity among sea-going men, the Navy is in no way responsible in time of peace for the merchant marine; however, the moment war threatens this condition changes and an added responsibility for the safety of vessels of the mercantile marine presents itself. These vessels fly the flag of the United States. The protection of the merchant marine has since the dawn of history been recognized as a leading function of the armed forces of a maritime nation. This responsibility presents an additional reason for a far-flung, carefully trained communication system instantly available on outbreak of war to convey information and orders to these vessels.

The requirements pictured above show the necessity for a veritable communication net-work with its consequent complications, by which every unit in the Navy and merchant marine can be provided with quick communication to every other unit. The training and the perfection of such an extensive organization for use in war would alone necessitate its maintenance and upbuilding in peace even if it were not practically useful until war was declared, exactly as is the case with gunnery training. But, it is found that the system is of vital practical use in peace for transmitting communications. Furthermore, its use in peace is a military necessity in rendering possible the war training of the fleet itself. By its means, the fleet is enabled to operate and maneuver in peace, exactly as it would operate in war; all experience demonstrates that successful operation of any naval force in war is assured only if such operations are a continuation of the activi-

ties habitually practiced in peace. This is the reason for the continual training exercises and maneuvers of naval forces during peace. The outbreak of war should produce no radical change in naval routine; merely an intensified performance. Efficient training of the fleet itself, therefore, demands that the communication system be operated in peace identically as it will be in war.

In consonance with its mission, the naval communication system is designed to handle communications by all of the various methods known, such as, radio, telegraph, telephone, visual signals, sound, under-water telegraph, post, despatch mail, courier, and pigeons—each method being used for the purpose for which it is best adapted. For example, telegraph and telephone are used primarily for communication between naval units on shore. This is especially necessary in congested regions, such as, the Norfolk to Boston area where the large amount of local communications renders it necessary to minimize radio transmissions and utilize the available frequencies for ships at sea, aircraft, broadcasting, and similar services which have no substitute means. For communication between ships and shore and between ships not in company with each other, radio is of course the dependence; for ships afloat in immediate proximity to each other, visual signals are used to relieve the congestion in the ether, just as wire communication is used for similar purposes on shore; ordinary postal facilities are used both ashore and afloat, each ship and naval station being provided with an official branch post office which is a part of the postal system of the United States, the entire being systematized and regulated to insure accuracy and expedition in the handling of naval mail. Despatch mail handled by guard boat is used between ships afloat for those communications not requiring instantaneous transmission. For especially important or vitally secret matter, the courier system is used both afloat and ashore; and pigeons provide communications from aircraft to their base in case of a failure of radio, as for example, in case of a crash or a forced landing.

Military requirements are by no means satisfied by merely one radio circuit to each ship. Owing to the necessities of organization, any unit commander must be able to communicate at any time with the commander-in-chief, with his immediate senior, with his immediate subordinates, with aircraft, with submarines, with

shore bases and with other units of the fleet. The above requirements render it necessary for large ships to be so fitted as to be able to transmit simultaneously from five to seven messages and at the same time to receive messages on eight other circuits. The problem of carrying on these communications in the small compass of one ship, especially when surrounded by numerous other ships at a few hundred yards distance, each doing the same thing, will be appreciated by any one familiar with the technical features of radio.

The shore radio system of the Navy is composed of a series of high power stations, such as, Annapolis, San Juan, Balboa, San Diego, San Francisco, Honolulu, Guam, and Cavite, which communicate only with each other and are used solely for long distance and fleet intercept work. Besides this, a system of so-called "fleet stations" of approximately 1,000 miles radius are assigned primarily for handling work direct to and from the fleet; in addition to this, a system of short distance "coastal stations" are so distributed along the coast that any vessel with a radio range of 100 miles can communicate with shore and thus put a message into the communication system whence it will be delivered to a naval unit in any part of the world. In addition to the above, there is an aircraft net-work which provides means of communication between air stations, and with aircraft in flight, thus automatically keeping planes informed of prospective weather and other conditions in the area through which they must fly. In harbors frequented by large detachments of the fleet, there are established on shore as conditions demand, so-called "signal stations." These are equipped with visual signal apparatus and with short range radio and are connected by telephone to the local telephone exchange, to the district commandant and to the local radio station, thus providing for the large amount of traffic between the fleet at anchor and the shore.

During times of peace, the various navy yards, naval stations, and other shore units habitually use the commercial wire systems for quick communication with the department and with each other; in order to insure prompt service entirely under naval jurisdiction in time of war, an extensive leased wire net-work obtained from these commercial companies would supplant this peace-time practice.

So far, we have considered the question of "traffic" alone. To the layman, "communications" means "traffic"—the transmission of messages from one person to another. But traffic is only one feature in which radio is serviceable to the sea-going man. In the World War, the value of direction-finding in locating both friendly and enemy vessels at sea was fully demonstrated. By means of the direction-finder, shore stations are enabled to determine the direction from which a radio emission is coming, and by plotting the line of direction thus simultaneously observed by two shore stations the position of the ship may be fixed almost with the same degree of accuracy as if plotted by two stations on shore, each of which observed the same ship by visual means. Thus, the position of a friendly ship approaching our coast in a fog can be determined and furnished to her by radio, enabling her to make port without delay, thereby reducing the time during which she would otherwise remain exposed to the dangers of attack during war. Similar observations may be taken upon an enemy ship operating off our coast if he is using his radio; or as an alternative, this compass system will impose upon him the restraint of "radio silence" with its corresponding deleterious effects upon his own operations.

In consequence of experience gained during the World War, the Navy maintains along our coasts a system of these radio compass stations. It has been found that they form an invaluable aid to navigation, providing a means to assist ships in making port in a fog in peace in all respects the same as described above in war. Though radio beacons are established along our coasts as a part of the regular aids to navigation, these involve the use of direction finders on board ship. Notwithstanding the fact that nearly all naval ships are equipped with direction finders, the reaction between the various radio circuits which it is necessary for vessels of the fleet to maintain, interferes with the accuracy of such observations and renders the radio compass of especial value to the Navy for navigation purposes under these conditions. The services of the naval radio compass system is extended without charge to vessels of the merchant marine and that it is of inestimable value to them is shown by the fact that it now furnishes to the merchant marine alone approximately 200,000 bearings annually. Countless letters are received by the Navy Department expressing appreciation of the service rendered.

The extensive radio system described above, though designed solely for the service of the fleet in war and though used for the fleet during peace exactly as would be required in war, is obviously available for numerous beneficial uses in peace exactly as in the case of the radio compass stations. It is the policy of the Navy to use its communication system during peace in every legitimate manner to promote our national interests. The Naval communication system thus serves the nation in innumerable ways not known to the average citizen and especially is this true of the service rendered to the merchant marine whose conditions of life so closely approximate our own. For example, the naval system is used to broadcast time signals, weather, and hydrographic reports periodically during each day, thus giving information to our merchant ships at sea in all parts of the world on these features so essential to their safety. The time signal enables the navigator to determine his position at sea; weather reports enable him to foretell the weather and frequently to avoid storm centers and atmospheric disturbances; hydrographic reports give him the latest information concerning aids and dangers to navigation such as derelicts, ice bergs, changed characteristics of lights, displaced buoys, and similar information. The extensive distribution of our radio stations along the coast renders it possible for those ships of moderate radio range to despatch messages ashore from almost any position within radio range of the coast line; the handling of commercial messages at such points as Guantanamo provides a feeder from outlying islands to our commercial cable systems, when these messages are placed upon American cables. The handling of commercial messages from such remote stations as Alaska and Samoa where no commercial communication facilities exist, provides a means by which the people in these isolated places may communicate with the outside world; the naval communication system is used without charge to transmit official despatches for all departments of the government and in this manner alone saves the government approximately $1,000,000 per year. The spirit of *camaraderie* which exists among those who encounter the vicissitudes of the sea in itself prompts the Navy to render every possible assistance to its brothers in the merchant service. Not only does the Navy experience a keen pleasure in its ability to serve them with time, weather, hydrographic reports,

with compass bearings and with facilities for communicating with shore, but with a feeling of deep regard for its responsibility for the safety of our merchant ships just prior to the outbreak of war, its facilities are extended to them and provisions are made to insure ability of masters to keep informed of the situation at home, to communicate with their owners or with the Navy Department, and to receive at that critical time, orders pertaining to their safety. After war breaks out, so far as communications are concerned, ships of the U. S. merchant marine enjoy the same facilities and privileges afforded by the naval communication system as is accorded to vessels of the United States Navy.

I cannot conclude this picture of Naval Communications more appropriately or more convincingly than by quoting the Articles pertaining to Naval Communications which are contained in "United States Naval Policy," prepared by the General Board and officially promulgated by the Secretary of the Navy March 29, 1922. The policy governing communications is expressed in eight articles. It will be noted that these articles cover not only the question of communications for the Navy alone, but include the utilization of this system for the merchant marine and for the promotion of national interests. In quoting the articles, they are arranged under these headings:—

(1) Policies relating particularly to the service of the fleet:

a) To maintain and operate a naval communication system based on the requirements of the forces afloat in a campaign in either or both oceans.

b) To provide and operate radio compass stations as required.

c) To develop within the fleet the uses of all forms of communications required for battle efficiency.

(2) Policies relating particularly to the service of the merchant marine:

a) To provide adequate radio communication facilities to mariners along the U. S. coasts where privately owned facilities are not made available.

(3) Policies relating primarily to civil or national interests:

a) To promote harmony and cooperation between naval radio systems and all other radio systems and to define the areas of their activities.

b) To watch and guard the radio and cable interests of the United States.

c) To use the naval radio communication system in time of peace to assist in the development of American interests abroad.

To this might be added an additional Article:

a) To utilize the naval communication system to maximum advantage in peace in handling official traffic for all departments of the government as a means of governmental economy.

THE FUTURE OF OUR MERCHANT MARINE

By Alfred H. Haag

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THE PROSPERITY of the United States is largely dependent on its ability to export its surplus commodities. It is obvious, therefore, the issue is of national scope—not sectional. Industries operating to maximum employment, permits quantity production reducing the cost of the commodities for home consumption and puts us in a better position to meet foreign competition. This country naturally expects her share of the world's commerce. To acquire her share we must have American ships to carry our exports and imports. We must also have Americans to represent us in the foreign field.

America acquired a great fleet of merchant vessels due to an emergency. The destiny of the civilized world depended largely upon the rapid production of ships. Almost over night the shipping industry grew from a sickly infant to one of enormous proportions. Let it be said right here in answer to the unjust criticisms directed at the United States Shipping Board, charged with the responsibility for producing inferior and unsuitable ships, that those who have and still are criticising the board display a gross ignorance of the condition which existed during the emergency. It is a fact that $3,500,000,000 was spent in the production of an emergency fleet. Many ships were constructed of wood, as well as some composite ships, and some concrete ships. America, without any selfish thought for the future, produced ships of these various materials, due to the fact that the materials were then available while a shortage existed in steel for ship purposes. To build steel ships in the large number required meant building additional shipyards with elaborate equipment. In the meantime wood, concrete, and composite ships were contracted for, which construction was carried on while the additional yards for steel ship construction were under way.

Let it also be remembered that this vast shipbuilding program was handled with but few experienced men in the art of shipbuilding. However, always the thought was uppermost in mind to produce ships the quickest possible way to replace the enormous tonnage being destroyed. Also let us refresh our memory with the thought that a safe voyage paid for the cost of the ship.

Since the emergency we have had a fleet on our hands and in the attempt to operate these emergency ships we have spent hundreds of millions of dollars more. The greater percentage of the fleet of ships produced during the emergency are unsuitable for competitive purposes. They are a constant source of expense to the government either when idle or when in operation. A scrapping program even at this late date would seem plausible.

America has just recently completed scrapping her most modern naval vessels which cost the nation hundreds of millions of dollars —surely the American people cannot consistently object to scrapping merchant vessels built for an emergency and unsuitable for competitive purposes. Due to the increased cost of building and of operating American vessels which all must agree is a hardship and a very difficult problem to solve we should not further handicap ourselves by operating ships unfit for competitive purposes. The first fundamental in successful shipping competition is to have ships of the proper types and sizes for the particular trade they are engaged in.

It seems as if the time were opportune for our country to launch a building program of merchant vessels designed to meet the competition existing today in the various trade routes, paying particular attention to producing ships of the larger and faster types which can be converted into cruisers in times of emergency, particularly in view of the limitations being placed on naval tonnage.

American shipyards can build such ships and the activities of our shipyards should be stimulated. Shipyards should be regarded as a national asset; they can and have built, repaired, and drydocked many naval vessels and during an emergency can virtually perform the work of a navy yard. With the curtailment of building of naval tonnage, the building of merchant tonnage should be proportionately increased for the sea power of a nation is governed by the combined naval and merchant tonnage. America can produce ships to equal those of any nation. The higher cost of con-

struction and operation to face will serve as an incentive to exercise the utmost care in producing ships for competitive purposes that will overcome some of the handicaps existing.

The slogan of one of our leading American shipyards, the Newport News Shipbuilding Company, "To build ships at a profit if we can, at a loss if we must, but always good ships," no doubt reflects the sentiment of the American shipbuilding industry. Homer L. Ferguson, the president of the company and one of the nation's keenest shipping authorities, has consistently maintained this policy and his shipyard is still in existence, just recently breaking a peace-time record for American shipyards by launching nine ships and laying the keel of two others in one day.

If we are to have continued prosperity we must acquire our share of the world's commerce and transport those commodities to the markets of the world in American ships the equal of those of our competitors and maintain a service on a parity or better than our nearest competitor. We have a great deal to overcome in this respect for when we compare the merchant tonnage of the five leading nations we find the United States has 12,400,000 tons of merchant ships. The British Empire has 20,300,000 tons; Japan 3,500,000 tons, France 3,125,000 tons, and Italy 3,000,000 tons.

A very important factor as regards competition is the speed of these vessels, the United States having 2,360 ships under 12 knots; the British Empire 2,800 ships under 12 knots; Japan 750 ships under 12 knots; France 460 ships under 12 knots, and Italy 472 ships under 12 knots. The next reference is decidedly interesting as it shows that the United States has only 215 vessels as compared with 1,287 vessels of the British Empire which are between 12 and 14 knots, while Japan has 207, France 211 and Italy 160 such vessels. The British Empire has 309 vessels as compared with fifty-one of the United States ranging in speed between 15 and 19 knots, the British outranking us six to one. France runs second to Great Britain with seventy-eight such vessels; Italy has thirty and Japan nineteen. In ships over 20 knots we rank fourth, Great Britain having forty-two vessels, France nine, Italy nine, the United States four, and Japan two. These naturally are big odds to overcome. However, to successfully compete they must be met.

It is well at this time to again emphasize the importance of the larger fast ships since the United States is outclassed six to one in this respect for these are the vessels which can be quickly converted into naval auxiliaries and might be termed cruisers in peace-time garb. The speed with which the large ships of the Cunard Line were converted into combatant vessels is a matter of historical record. One of them, the *Carmania,* was actually at sea as a fully equipped armed cruiser only a week after she had entered port as an ordinary first class Atlantic liner. In view of the limitation of naval vessels the upbuilding of a merchant marine with particular reference to the larger and faster ships becomes a paramount issue.

A question which has received rather scant attention and which is of vital importance in the successful operation of our merchant marine is that of American representation in foreign lands. It is just as essential to have Americans represent us in the field of foreign service as it is to carry our commerce in American bottoms. To dispose of our surplus products in foreign lands requires men acquainted with the habits and the customs of the people and the physical conditions of that country. Their experience and training must qualify them to be on a par with the native representative of that particular country. They must have the ability to sell our products in addition to booking commodities for return cargo. Successful competition of merchant shipping can only be accomplished by carrying cargo both ways. Our representatives must be trained to be ship-minded, not only should they have a thorough knowledge of foreign and domestic commerce but in the foreign organization there should be men thoroughly familiar with the characteristics of a ship, always with a ready and intelligent answer for the exporter. He should have a thorough knowledge of the freight-handling facilities at the ports in his jurisdiction as well as facilities for inland transportation. He should constantly keep American shippers informed as to the requirements for packing commodities as to size and climatic conditions in order that goods will reach their destination intact. This not only expedites delivery but often results in repeat orders and a satisfied customer. This country is in constant quest for men with these qualifications.

The future of our merchant marine largely depends in carrying out the policy as expressed in the Merchant Marine Act of

1912. It is necessary for the national defense and for the proper growth of its foreign and domestic commerce that the United States shall have a merchant marine of the best equipped and the most suitable types of vessels sufficient to carry the greater portion of its commerce and serve as a naval or military auxiliary in time of war or national emergency, ultimately to be owned and operated privately by citizens of the United States. This applies to conditions existing today and for the future.

COMPARATIVE NAVAL DATA FOR THE TREATY NAVIES*

(Correct as of October 1, 1925)

(Comparison based on ratio of tonnage for capital ships established by Washington Conference Treaties for Limitation of Naval Armament)

TABLE I—PERSONNEL (Unlimited)

POWER	REGULAR ESTABLISHMENT (INCLUDING THOSE OF DOMINIONS) (X)		REGULAR ESTABLISHMENT ON BASIS OF 5-5-3-1.67-1.67 RATIO WITH BRITISH EMPIRE		INCREMENT NECESSARY TO ATTAIN THE 5-5-3-1.67-1.67 IN REGULAR ESTABLISHMENT		ACTUAL RESERVE PERSONNEL	
	Officers	Men	Officers	Men	Officers	Men	Officers	Men
UNITED STATES	8,312	81,702	8,846	95,922	534	14,220	5,037(c)	25,030(c)
BRITISH EMPIRE	8,846(a)	95,922(a)	8,846	95,922	None		10,425(d)	64,742(d)
JAPANESE EMPIRE	7,143(b)	65,412	5,307	57,553	None		3,394	38,988
FRANCE	3,493	50,487	2,954	32,037	None		8,945	153,980
ITALY	2,233	40,881	2,954	32,037	721	None	4,731	60,000

a) Includes 357 officers and 2,480 men of Royal Air Force performing naval aviation duties. The Royal Air Force is a separate department, ranking with the army and navy, and has in round numbers (August 31, 1925) 3,448 officers, 29,797 airmen, and 8,763 civilians. Since in the United States, Japan, and France, naval aviation personnel forms an integral part of the navy, it seems only fair that the personnel of the British Royal Air Force performing duties in connection with naval aviation should be classed in this comparison. Includes 4,157 merchant marine personnel manning auxiliaries such as tankers, yard craft, hospital ships, fleet service tugs, etc., which are manned in the U.S. Navy by regular officers and men.

b) Does not include 390 midshipmen at sea. Does not include approximately 260 civilians performing naval duties performed in U.S. Navy by regular officers.

c) Includes 1,369 retired officers of all ages and 277 retired enlisted men under fifty-five years of age.

d) Includes 7,324 retired officers of all ages and 19,020 retired enlisted men under fifty-five years of age.

X) Above personnel figures do not include marine corps personnel. The United States has 1,169 officers and 17,731 men in the marine corps, of which 64 officers and 2,113 enlisted men serve afloat. The British Empire has 448 officers and 10,029 men in the marines, of whom 180 officers and 5,782 enlisted men serve afloat. Japan has no force corresponding to the marine corps of the United States and the British Empire.

		U. S.	BRIT. EMP	JAP. EMP	FRANCE	ITALY
ACTUAL RATIOS	Officers, regular establishment	4.69	5.00	4.26	1.97	1.26
	Enlisted men	4.26	5.00	3.41	2.63	2.13
RATIO APPLIED TO CAPITAL SHIPS BY TREATY		5.00	5.00	3.00	1.67	1.67

*Editor's Note: These tables are made out each year as of 1 October. As the ones for 1926 are not yet available and as the changes in the past year are not great the data published in the February 1926 issue of the PROCEEDINGS is reprinted in this special information number.

TABLE II—CAPITAL SHIPS (Limited)

POWER	SCRAPPED UNDER TREATY TERMS						RETAINED (X)		TONNAGE TO BE ARRIVED AT IN 1941	TRUE RATIO
	SHIPS-COMPLETED		SHIPS-BUILDING		TOTAL					
	No.	TONS	No.	TONS	No.	TONS	No.	TONS		
UNITED STATES..	19(a)	289,580	13(d)	552,800	32	842,380	18	525,850	525,000	5.00
BRITISH EMPIRE .	22(b)	447,750	None		22	447,750	22(e)	580,450	525,000	5.00
JAPANESE EMPIRE	12(c)	192,751	4	161,958	16	354,709	10	301,320	315,000	3.00
FRANCE.....	None		None		None		9(f)	194,544	175,000	1.67
ITALY.....	None		None		None		7(g)	133,670	175,000	1.67

a) Includes *Delaware* and *North Dakota*, scrapped upon completion of *Colorado* and *West Virginia* in 1923. Includes *Oregon* and *Illinois*, permitted to be retained for noncombatant purposes.

b) Includes *Collingwood* and *Colossus*, permitted to be retained for noncombatant purposes.

c) Includes *Asahi* and *Shikishima*, permitted to be retained for noncombatant purposes.

d) Includes battle cruisers *Lexington* and *Saratoga*, which are to be completed as aircraft carriers.

e) Upon completion of *Nelson* and *Rodney* in 1926, *Ajax*, *Centurion*, *King George V. and Thunderer* will be scrapped, giving British Empire twenty capital ships of 558,950 tons displacement.

f) Battleship *France*, 23,500 tons, foundered in Quiberon Bay, August 1922, thus decreasing the actual number of capital ships retained by the Republic of France as per treaty from ten to nine.

g) The battleships *Leonardo Da Vinci*, *V. Emanuele*, and *Regina Elena*, were voluntarily scrapped in 1922–23, thereby reducing the actual number of ships retained by Italy as per treaty from ten to seven

X) British Empire and Japanese Empire retain four battle cruisers each, United States retaining none. When *Nelson* and *Rodney* are completed, the following status will be obtained:

	U. S.	BRIT. EMP.	JAP. EMP.	FRANCE	ITALY
CAPITAL SHIPS ARMED WITH 13.4-INCH GUNS OR HEAVIER ..	14	20	10	3	0
CAPITAL SHIPS ARMED WITH 12-INCH GUNS.....	4	0	0	6	7

TABLE III—AIRCRAFT CARRIERS (Limited)

POWER	BUILT (a)		BUILDING		TOTALS		TOTALS OF NON-EXPERIMENTAL CARRIERS		TOTAL TONNAGE ALLOWED BY TREATY	INCREMENT NECESSARY TO ATTAIN ALLOWANCE (f) TONS
	No.	TONS	No.	TONS	No.	TONS	No.	TONS		
UNITED STATES.....	1	12,700	2(b)	66,000	3	78,700	2	66,000	135,000	69,000
BRITISH EMPIRE.....	4	67,290	2(c)	37,200	6	104,490	3	56,300	135,000	78,700
JAPANESE EMPIRE.....	1	9,500	2(d)	53,800	3	63,300	2	53,800	81,000	27,200
FRANCE.....	None		1(e)	21,160	1	21,160	1	21,160	60,000	38,840
ITALY.....	None		None		None		None		60,000	60,000

a) All experimental, with exception of British carrier *Furious* of 19,100 tons completed September, 1925. Under terms of treaty, experimental carriers can be replaced at any time, provided total carrier tonnage is not exceeded.

b) *Lexington* and *Saratoga* which were building as battle cruisers, are to be completed as aircraft carriers.

c) *Courageous* and *Glorious*. In addition, one aircraft carrier is being definitely considered by Australia.

d) *Akagi*, formerly building as battle cruiser; *Kaga*, formerly building as battleship.

e) *Bearn*, ex-battleship.

f) Maximum individual tonnage of aircraft carriers is 27,000 tons. Most powers favor smaller carriers than this. General Board of United States Navy recommends immediate construction of one 23,000-ton carrier.

	U. S.	Brit. Emp.	Jap. Emp.	France	Italy
Actual Ratio, Aircraft Carriers Built and Building (tons)	2.91	3.87	2.35	0.78	0.00
Allowed Ratio, Aircraft Carriers, (tons)	5.00	5.00	3.00	2.22	2.22

Table IV—Modern Cruisers

5-inch to 8-inch Guns: 3,000–10,000 Tons; 27 Knots Plus—(Unlimited)

Power	Built		Authorized and Appropriated for, or Building		Totals		Tonnage on basis of 5-5-3-1.67-1.67	To Attain 5-5-3-1.67-1.67 Ratio with Britain	
	No.	Tons	No.	Tons	No.	Tons		No. (c)	Tons
United States	10	75,000	2(a)	20,000	12	95,000	304,290	21	209,290
British Empire	38	179,190	13(b)	125,100	51	304,290	304,290	None	
Japanese Empire	16	82,210	9	73,995	25	156,205	182,574	3	26,369
France	3	16,734	6	53,619	9	70,353	101,632	3	31,279
Italy	8	30,784	2	20,000	10	50,784	101,632	5	50,848

a) The Sixty-eighth Congress authorized eight 10,000 ton cruisers, appropriating for only two.

b) Includes two 10,000 ton cruisers building for Australia.

c) Number obtained by dividing tonnage by 10,000 tons, the maximum size cruiser allowed by treaty.

Actual Ratios, Modern Cruisers	U. S.	Brit. Emp.	Jap. Emp.	France	Italy
Tonnage	1.56	5.00	2.57	1.15	0.83
Number of Vessels	1.18	5.00	2.45	0.88	0.98
Capital Ship Ratio	5.00	5.00	3.00	1.67	1.67

Table V—Destroyer Type, First Line Vessels (Unlimited)

Power	Built				Authorized and Appropriated for or Building				Totals			
	Leaders		Destroyers		Leaders		Destroyers		Leaders		Destroyers	
	No.	Tons	No.	Tons	No.	Tons	No.	Tons	No.	Tons	No.	Tons
United States	None		281(a)	334,684	None		None		None		281	334,684
British Empire	18(b)	31,310	183(c)	209,265	None		2	2,700	18	31,310	185	211,965
Japanese Empire	None		72	77,025	None		20	28,855	None		92	105,880
France	1	2,067	19	18,628	6	14,154	18	26,034	7	16,221	37	44,662
Italy	8	14,889	22(e)	18,839	None		25(d)	26,622	8	14,889	47	45,461

Characteristics: Destroyer Leaders, 1,500 tons plus; 27 knots plus.
Destroyers, first line, 800–1,500 tons; 27 knots plus.

a) Includes fourteen light mine layers, destroyer type. Nearly all of these 281 boats, which give the United States a preponderance in this type, were laid down during the World War in an emergency program to combat the German submarines; many of them are of hasty construction. Only 106 destroyers and six mine layers, total 112, are kept in commission.

b) Includes one mine layer. c) Includes one mine layer. d) Includes nine combined mine layers and mine sweepers.

e) Includes three mine layers.

Actual Ratios, Modern Destroyer Types:	U. S.	Brit. Emp.	Jap. Emp.	France	Italy
Total Combined Tonnage	6.88	5.00	2.18	1.25	1.24
Total Combined Number of Vessels	6.92	5.00	2.26	1.08	1.35
Capital Ships Ratio	5.00	5.00	3.00	1.67	1.67

Table VI—Fleet Submarines, First Line

Over 1,000 Tons Each; 20 Knots Plus (Unlimited)

Power	Built		Authorized and Appropriated for, or Building		Totals		Tonnage on Basis of 5-5-3-1.67-1.67	To Attain the 5-5-3-1.67-1.67 Ratio with British Empire
	No.	Tons	No.	Tons	No.	Tons		No. (g) Tons
United States	5(a)	7,556(a)	4	(b)	9	15,556(f)	20,900	3 5,344
British Empire	8(c)	16,460	3(d)	4,440	11	20,900	20,900	None
Japanese Empire	2	2,800	18(e)	26,280	20	29,080	12,540	None
France		None	2	6,000	2	6,000	6,980	1 980
Italy		None	4	5,200	4	5,200	6,980	1 1,780

a) Includes *T-1*, *T-2*, and *T-3*, out of commission; engines failures.

b) Tonnage not available; includes one-2,119-ton fleet submarine, one mine laying submarine, and two cruiser submarines, all *V*-types.

c) Does not include three 1,600-ton monitor submarines, *M-1*, *M-2*, and *M-3*. (Note *M-1*, lost November 12, 1925.)

d) Includes two 1,480-ton submarines building for Australia.

e) Does not include three 1000-ton mine-layers.

f) Estimated only on average basis of 2,000 tons per ship for ships building.

g) Number arrived at by assuming an arbitrary boat tonnage of 2,000 tons.

Actual Ratios, Fleet Submarines:	U. S.	Brit. Emp.	Jap. Emp.	France	Italy
Tonnage	3.72	5.00	6.96	1.43	1.24
Number of Vessels	4.09	5.00	9.09	0.91	1.82
Capital Ship Ratios	5.00	5.00	3.00	1.67	1.67

Table VII—Submarines, First Line

700 Tons Plus, 13 Knots Plus (Unlimited)

Power	Built		Authorized and Appropriated for, or Building		Totals		Tonnage on basis of 5-5-3-1.67-1.67	To Attain the 5-5-3-1.67-1.67-Ratio with British Empire
	No.	Tons	No.	Tons	No.	Tons		No. Tons
United States	50(a)	43,822	None		50	43,822	25,340	None
British Empire	26(b)	23,560	2	1,780	28	25,340	25,340	None
Japanese Empire	41	32,838	4(c)	3,659	45	36,497	15,204	None
France	15(d)	12,993	18	13,281(e)	33	26,274	8,463	None
Italy	10	7,902	8	6,340	18	14,242	8,463	None

a) Includes *S-21*, sunk September 25, 1925.

b) Does not include three 1,600-ton monitor submarines, *M-1*, *M-2*, and *M-3*. Does not include three mine layers totalling 2,670 tons.

c) Does not include three 1,000-ton mine layers.

d) Does not include three mine layers totalling 2,988 tons.

e) Does not include tonnage of seven ships, details unknown.

Actual Ratios, Submarines, First Line ..	U. S.	Brit. Emp.	Jap. Emp.	France	Italy
Tonnage	8.64	5.00	7.20	5.18	2.81
Number of Vessels	8.93	5.00	8.03	5.89	3.21
Capital Ship Ratios	5.00	5.00	3.00	1.67	1.67

Table VIII—Naval Air Strength (Unlimited)

A. Data on Plane-Carrying Capacity of Fleets. The following table indicates the airplanes which it is estimated may be carried and launched for effective attack by combatant ships of the fleets at sea, away from a coast defense area of 1,000 miles.

Power	Plane-Carrying Capacity—Built		Plane-Carrying Capacity—Building		Total	Plane-Carrying Capacity on Basis of 5-5-3-1.67-1.67	To Attain the 5-5-3-1.67-1.67 Capacity with British Empire(b)
	Aircraft Carriers	Battleships and Cruisers	Aircraft Carriers	Battleships and Cruisers			
United States	30	74	144	4	252	468	216
British Empire	162	116(a)	144	46	468	468	None
Japanese Empire	26	42	144	18	230	281	51
France	0	27	72	12	111	156	45
Italy	0	30	0	4	34	156	122

a) Does not include capacity of four battleships to be scrapped in 1926.

b) Possible to attain capacity by (1) building large aircraft carriers to total tonnage allowed by treaty, (2) building cruisers to carry planes, cruisers not being limited as to numbers, and (3) building carriers of less than 10,000 tons displacement, these being unlimited by treaty.

Actual Ratios, Naval Air Strength:	U. S.	Brit. Emp.	Jap. Emp.	France	Italy
Plane Carrying Capacity	2.69	3.00	2.46	1.19	0.36
Capital Ship Ratios	5.00	5.00	3.00	1.67	1.67

B. General Data Regarding Naval Aviation

	United States	British Empire	Japanese Empire	France	Italy
Heavier-than-air craft in commission exclusive of school and training.	218	116(a)	148(X)	84	(b)
Heavier-than-air craft in reserve	180	100%	305(X)	96	(b)
Personnel: Officers	709(c)	476(d)	400(X)	210	(e)
Enlisted men	4,537(c)	2,871(d)	3,500(X)	3,500	(e)
Reserve	412	(f)	(f)	(f)	(f)
Lighter-than-air craft					
Built	5(g)	4(h)	2	6	6
Authorized	None	2(i)	1	None	None

a) Fleet air arm. (544 additional planes in general service in Royal Air Force.) (b) Naval planes are in general army and navy service. Planes in active general service number 605; in reserve, 467.

c) Includes marine corps personnel.

d) This figure is not accurate as a basis of comparison, as it does not include administrative and other overhead personnel of the Royal Air Force which serves the fleet air arm. An estimate of personnel required by the British Empire for naval aviation separately is: 1,024 officers and 8,939 men.

e) Included in general service, which has 767 officers and 16,716 men.
f) Information not available.
g) Includes the non-military rigid *Los Angeles* of 2,764,461 cubic feet, 3 small non-rigids, and 1 small semi-rigid.
h) Large rigid type.
i) Both of 5,000,000 cubic feet; one eventually for commercial use.
X) Estimated from available data; no official data available.

Table IX—Vessels Laid Down or Appropriated for Since 6 February 1922

(Date of Washington Conference Limiting Naval Armaments)

Type	United States			British Empire			Japanese Empire			France			Italy (f)		
	Laid Down	Appro. for	Total	Laid Down	Appro. for	Total	Laid Down	Appro. for	Total	Laid Down	Appro. for	Total	Laid Down	Appro. for	Total
Battleships	..	..	..	2	..	2	..	..	..	..	..	..	..	..	..
Aircraft Carriers, 1st line	2(a)	..	2	2	(b)	2	2(c)	..	2	..	1	1	..	..	..
Light (Modern) Cruisers, 1st line	..	2	2	7 (d)	4	11	12	..	12	5	1	6	2	..	2
Cruiser Mine Layers	..	..	..	1	..	1	..	1	1	..	..	..	..	..	..
Destroyer Leaders	..	..	..	..	..	..	..	..	..	6	3	9	..	..	..
Destroyers	..	..	..	2	..	2	24	11	35	18	4	22	16	..	16
Submarines(all classes)	1	2	3	3	..	3	19	11	30	23	9	32	12	..	12
Gunboats	..	6	6	..	4	4	4(e)	..	4	..	..	..	..	..	..
Mine Sweepers	..	..	..	..	..	..	6	..	6	..	..	..	9(g)	..	9
Submarine Tenders	..	..	..	..	..	..	2	..	2	..	..	..	..	..	..
Tankers	..	..	..	..	..	..	3	..	3	1	..	1	4	..	4
Supply Ships	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..
Totals			13			25			96			71			43

a) The *Lexington* and *Saratoga* were authorized by the terms of the Washington Conference to be converted into aircraft carriers, and are included in these tables.
b) Table does not include one aircraft carrier (of about 6,000 tons) being considered by Australia.
c) *Akagi* and *Kaga* were authorized by the terms of the Washington Conference to be converted into aircraft carriers, and are included in these tables.
d) *Emerald* and *Enterprise* were laid down prior to conference and are not included in these tables.
e) These are river gunboats.
f) No definite information concerning building program under consideration.
g) Are both mine sweepers and mine layers.

Table X—Projected Building Programs of Foreign Powers

(Additional to Ships Building in Preceding Tables)

British Empire: Five-year program—nine 10,000-ton cruisers: seven 8,000-ton cruisers; twenty-seven first line destroyers; twenty-four fleet submarines; five gunboats; four patrol vessels; two submarine tenders; one repair ship; one net layer.

Japanese Empire: Five-year program—(Note: Following program proposed by Japanese Navy Department. It is believed that a cut will be made by the government in this program, or a compromise reached, because of the financial depression existing in Japan.)—four 10,000 ton cruisers; twenty 1,500 ton destroyers; ten 1,500 ton fleet submarines; three gunboats; one aircraft tender; two special service ships.

France: Five-year program—three light cruisers; eighteen first line destroyers; fifteen destroyer leaders; two mine layers; two fleet submarines; twenty-one first line submarines; six first line mine layers; four oil tankers; one submarine tender.

Italy: Proposed—under consideration—three light cruisers; eight first line destroyers; eight submarines.

DISCUSSION

Better Preparation for War

(See page 1496, August, 1926, PROCEEDINGS)

REAR ADMIRAL W. V. PRATT, U. S. NAVY.—It is a pleasure to read such a sound article as came out in the August issue of the PROCEEDINGS written by Captain A. W. Hinds, U. S. Navy, entitled "Better Preparation for War." There is nothing of the jingo in the article; nothing which could not and should not be read by every man and woman in the United States. It was good because it embodied such common sense, practical views.

Captain Hinds made three excellent points. They are to wit: complicated tactics, communication troubles and repair work by the fleet. In the studies made at the Naval War College of strategic and tactical problems, one of the essential principles of war by which maneuvers are judged is the principle of simplicity. If this principle is violated, the maneuver is not considered sound. This is not an off-hand statement but one which is supported by the best known tacticians of the day both on shore and afloat. The formations which are assigned to the fleet for their use today, together with the instructions covering their use, are too complicated, for all types.

In regard to Captain Hind's statement of communications, what he says is exactly true. We attempt to do too much extraneous business. In addition to that, the simplification of maneuvers will immediately reduce as well as simplify the number of messages we have to send about them.

In regard to the repair work being done by the fleet, it is thought that he has struck the right note.

After all, we will not get very far through the action of boards appointed to revise our system of communications and tactics. So far as I have seen, every board has one or more members on it whose desire is to think up the number of possible combinations which might be made against us and to prepare an answer for the same. This is not the province of true tactics. Every normal formation should be the essence of simplicity with the ability to pass into movement with the greatest ease and rapidity in order that through movement we may place our tactical units in any generally desired direction with the minimum loss of time. This combined with efficiency in the use of our offensive weapons is about all there is to tactics, provided there are intelligent governing heads who know the purpose and the simplest and best way to attain it. An acceptance of this principle imme-

diately precludes the necessity for innumerable "canned" solutions none of which are of any practical use when the time comes. It is largely for these reasons that it is believed a succession of boards of reviews will never achieve the object of producing simplicity in tactics or in the methods used in communicating tactical conceptions and acts. It is much more likely to be the work of one man who says "cut" and cuts drastically.

Air Tactics and Strategy

(See page 855, May, 1926, PROCEEDINGS.)

The Aeroplane, 7 July, 1926.—In the United States Naval Institute PROCEEDINGS of May, 1926, Lieutenant Forrest Sherman, U. S. Navy, contributes an article which illustrates clearly and quite convincingly the essential unity of the principles of war throughout all time, by showing that typical cases of successful tactics in air fighting during the last war were purely the result of the application of the known principles of military tactics to the particular conditions.

As an engineer and by no means a military engineer one can to some extent envy the military professions the possession of a body of teachers who so assiduously stress the immutability and the importance of fundamental principles.

Nevertheless, after having read a large number of essays devoted to the upholding of this doctrine, together with a number of somewhat acid attacks on the writers of articles and works dealing with the practice of military operations in the air because the said authors have failed to pay due homage to the orthodox, and in this case, undoubtedly true doctrine, one is left with a feeling that there is more to be said than has hitherto been said by professors of the art of war concerning the particular application of the fundamental principles of war to military operations carried out under modern conditions and with modern appliances.

Lieutenant Sherman's article is an advance in this respect on the majority of those which seek to inculcate the doctrine which he upholds. He seeks to prove his case—and in general very successfully—by taking specific cases of combat in the air, and showing that success in each case was the result of the application of known and established military principles to the particular circumstances.

But, writing still as an interested outsider, one feels that there is more to be said by the accepted authorities upon the art of war in order to guide those who to some considerable extent provide the fighting forces with their material equipment concerning not so much the immutable fundamental principles of war as the details of the application of those principles to particular circumstances not merely in the past but in a conceivable future.

It is not merely in the military art that fundamental principles are unchanged and unchangeable. In the art of structural engineering for example fundamental principles are today what they always have been and always will be. The strength and stiffness of a beam or a strut, the tenacity of a wire are governed by definite laws which are the same whether the strut, beam or tie was erected by a mediæval builder of cathedrals or a modern constructor of airplanes.

But between the practice of the mediæval architect and that of the modern structural engineer there is a great gulf fixed. Both, to succeed, must have complied with the fundamental principles of mechanics. The difference essentially lies in the fact that the modern engineer has available for his guidance first a more complete knowledge and a more accurate statement of those fundamental principles, and second a very greatly extended choice of structural material and of methods of working, transporting, and erecting those materials.

Principles do not change, but our knowledge of them does. And as our knowledge becomes more exact, methods of applying those principles to practical purposes in an effective manner under all sorts of circumstances become, or should become, more and more susceptible of precise prediction, and less and less problems to be resolved by a process of pure trial and error.

Technique, which is the application of fundamental principles to particular circumstances, must be based on correct principles, but does not itself share the immutability of its foundations. A correct technique may be applied by an individual who is totally ignorant of the fundamental basis upon which his practice rests. Nor is it impossible to discover those who, possessing a sound grasp of fundamentals, fail to build up on this sure foundation an efficient process of practical application.

The engineer or the soldier who adopts, in any given conditions, the correct technique will succeed, whatever may be his mental position in regard to first principles. And he who adopts a wrong technique will fail, however sound his grounding in fundamentals.

It is perfectly obvious that modern military forces do not neglect technique. The whole of the training of the rank and file, and of junior officers is a training in technique, and necessarily so. Concerning that which happens to senior officers in such exalted quarters as staff colleges and the like, one is profoundly ignorant, but very obviously their studies must be largely concerned with the application of principles to practice—which is also a matter of technique.

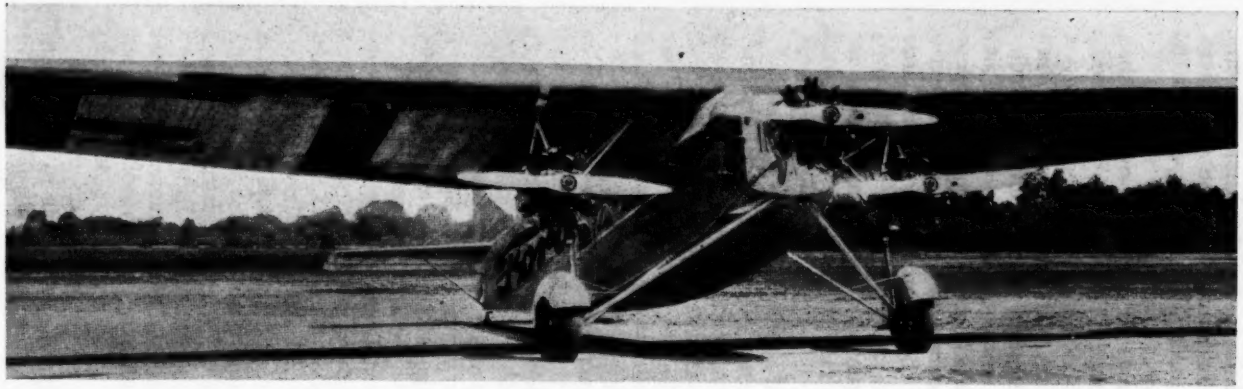
But there does seem to be a singular lack of writers, other than those of the purely imaginative kind, who have attempted to show how the technique of applying modern weapons in accordance with sound principles can be developed to the best advantage.—W. H. S.

In other words, what is wanted is a special edition of von Clausewitz interlarded with notes illustrating how the principles laid down by him apply specifically in detail to the use of aircraft in war.—C. G. G.

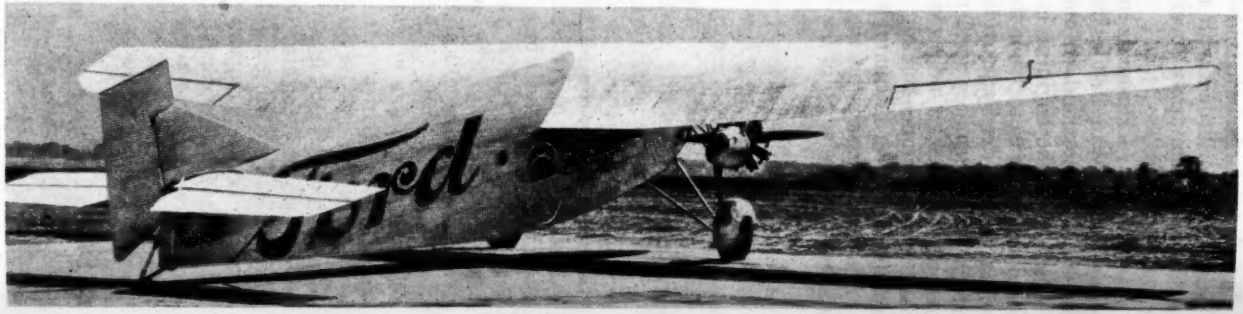
Not at all. Clausewitz may stand as the authority on the philosophy of war, just as for instance Thomson and Tait stood for years as the standard authority on Natural Philosophy.

The art of the engineer is based on Natural Philosophy. But one does not seek to train the engineer in any particular branch of that profession by providing an edition of Thomson and Tait interlarded with notes as to the practical application of principles to concrete cases. One provides a manual of engineering—a text-book of technique—which cannot be permanently a standard work except in a dormant industry.

And a few essays on the technique of modern war is what is wanted.—W. H. S.



FRONT VIEW OF THE NEW FORD ALL-METAL MONOPLANE, SHOWING THE LANDING GEAR AND THE INSTALLATION OF THE THREE WRIGHT "WHIRLWIND" ENGINES



REAR VIEW OF THE FORD ALL-METAL MONOPLANE, SHOWING ARRANGEMENT OF TAIL SURFACES AND TAIL SKIDS AND THE LARGE ENTRANCE DOOR IN THE SIDE OF THE FUSELAGE

REAR VIEW OF THE FORD ALL-METAL MONOPLANE, SHOWING ARRANGEMENT OF TAIL SURFACES AND TAIL SKIDS AND THE LARGE ENTRANCE DOOR IN THE SIDE OF THE FUSELAGE

PROFESSIONAL NOTES

PREPARED BY

LIEUTENANT COMMANDER W. G. GREENMAN, U. S. NAVY

FROM AUGUST 3 TO SEPTEMBER 3

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UNITED STATES

Vessels Under Construction, U. S. Navy—Progress as of July 31, 1926

Type Number and Name	Contractor	% of Completion Aug. 1, 1926 On	% of Completion Aug. 1, 1926 Total Ship	% of Completion July 1, 1926 On	% of Completion July 1, 1926 Total Ship	Contract date of Completion	Probable date of Completion
	AIRPLANE CARRIERS						
Lexington	Beth.S.B.Cpn.(Fore River)	83.6	82.3	82.6	81.2		6/1/27
Saratoga	New York S.B. Corp.	88.6	88.3	87.3	87.		4/1/27
	LIGHT CRUISERS						
Pensacola (Cl24)	N. Y. Navy Yard	0.9	0			7/9/29	
Salt Lake City(Cl25)	Wm. Cramp S & EB Company	0.1	0			7/9/29	
	AUXILIARIES						
Holland	Puget Sound Navy Yard	Commission 6/1/26					7/31/26
	FLEET SUBMARINES						
V-4(SM1)	Portsmouth Navy Yard	49.4	47.2	45.6	43.4		10/1/27
V-5(SC1)	Portsmouth Navy Yard	1.2	..	1.1	..		12/1/28
V-6(SC2)	Mare Island Navy Yard	.3	..	.1	..		3/1/29
	RIVER GUNBOATS						
PG43	Kiangnan Dock & Eng.Wks.	11.3	..	10.9	..		3/1/27
PG44	Kiangnan Dock & Eng.Wks.	10.8	..	10.4	..		4/1/27
PG45	Kiangnan Dock & Eng.Wks.	6.1	..	5.8	..		12/1/27
PG46	Kiangnan Dock & Eng.Wks.	5.8	..	5.	..		1/1/28
PG47	Kiangnan Dock & Eng.Wks.	8.2	..	7.2	..		8/1/27
PG48	Kiangnan Dock & Eng.Wks.	8.	..	7.	..		9/1/27

Authorized but not under construction.

Light Cruisers *CL26* to *28*—Funds appropriated to start construction in fiscal year 1927.

Authorized by Act of August 29, 1916, but no funds for construction appropriated

12 Destroyers Nos. 348 to 359 inclusive.
1 Transport No. 2.
3 Fleet Submarines Nos. 169 to 171 inclusive.
1 Neff Submarine No. 108.

Authorized by Act of December 18, 1924, but no funds for construction appropriated.

3 Light Cruisers Nos. 29 to 31 inclusive.

The Navy Strives for Peace

The Congregationalist, 29 April, 1926.—By Captain L. M. Overstreet, U. S. Navy.—After the Spanish-American War in 1898 and again after the World War in 1918, men have said to me, "What will the Navy do until the next war?" This query is easily answered. During the interval between wars our Navy is scattered over the seven seas, striving to preserve the peace of the world.

"War is not an abnormality," Secretary Hughes once said. In fact, the normal condition in this mad world is one of strife. Peace is only maintained in spots. The Navy, in its desire to reduce the number of war areas, has ships on duty throughout the world, striving for peace. At present, ships are distributed as follows:

Five cruisers in the West Indies, of which the flagship is at Arica, Chile, in connection with the Peruvian-Chilean arbitration; eight ships in Europe, cruising from Denmark to Roumania; a South China patrol of two gunboats on the Si Kiang River, between Hong Kong and Canton; and a Yangtze patrol of seven gunboats, on the Yangtze River, patrolling the lower 2,000 miles of this great river. This work in China is so difficult that the regular patrols are frequently reinforced by ships from the Asiatic fleet. At present, there is a third gunboat on the Si Kiang, a division of six destroyers on the Yangtze, a gunboat on the China coast, a Swatow, and a destroyer at Amoy.

How the Navy strives for peace, throughout the world, will be shown by relating a few instances.

In The West Indies

On July 27, 1915, our cruiser *Washington* was speeding for Haiti. On that day, as ordered by the black President, Guillaume Sam, 169 political prisoners had been murdered in their cells. The infuriated relatives had dragged the wretched Sam from his hiding place (a bathroom in the French Legation), murdered him, mutilated the body in a shocking manner, impaled the hands, feet, and head on sticks and were parading the streets.

President Sam had come into power at the head of a band of revolutionists some five months previous by driving out his predecessor, Davilmar Theodore, who had only been in office some four months. Prior to seizing the presidency, Sam had served in jail for falsifying government financial statements, to his own profit. He, therefore, had many political enemies, whom he threw in jail. He murdered them when he found that a new revolutionary leader, the fiery red-headed mulatto, Rosalvo Bobo, was threatening him. With Sam eliminated, Bobo could now, with his fifteen hundred Cacos (lawless negro bandits from the mountains), seize the presidency.

What should be our foreign policy in such a situation? What should the Navy do?

This is what the Navy did. Admiral Caperton promptly landed four hundred sailors and marines at Port au Prince. This number was insufficient to safeguard a revolutionary city of over one hundred thousand people. On August 4, the battleship *Connecticut* arrived with reinforcements and landed an expeditionary force of several hundred marines.

The gunboat *Eagle* was sent to Cape Haitian. The captain advised Bobo not to let his Cacos attack the city. The attack was made. A well-aimed shot from one of the *Eagle's* six-pounders knocked down the horse of the general who was leading the attack. The attack ended. The army was now disarmed and allowed to make a peaceful entry into the city.

August 12 was set for the election of a new president by Congress. Bobo's followers, fearful that he could not win, decided to start a riot and stop the election. The admiral landed additional men from the *Castine* and the *Eagle;* assigned a special guard to protect Bobo's opponent, Senator Dartiguenave; put a heavy guard around the House of Congress; allowed senators and deputies to carry firearms, as they feared to go otherwise; and had all friends of candidates searched, thus filling a wagon with weapons. A peaceful election was held.

Since this event, with our Navy in charge, good roads have been built, schoolhouses erected, customs moneys collected, the national debt adjusted and peace reigns. It is hoped peace may soon be so firmly established that the Navy may withdraw from Haiti, as it has done recently from Santo Domingo and from Nicaragua.

A Different Problem.—Had Germany, in 1902, landed a naval force in Venezuela, as contemplated, a strong German naval base would have been established. This would have forced the United States to strengthen her naval bases in the Carribbean in order to protect the Panama Canal, England to increase her naval bases at Trinidad and Jamaica, and the French to build up the defenses of Martinique. However, our President knew what the Navy was for and how it should be used in the preservation of international peace. President Roosevelt informed the German Ambassador that if the German fleet attempted to land men in Venezuela he would give orders to Admiral Dewey, who was then cruising in the West Indies, to oppose such a landing. The Germans decided not to land. Thus our fleet enforced the Monroe Doctrine and preserved peace in the Caribbean.

The Near East

The preservation of peace along the Dalmatian coast was a serious Post-World War problem. Both the Italians and the Serbians wanted this ex-Austro-Hungarian territory. The great powers, of one accord, turned to the Navy and assigned this difficult task to four admirals, one each from the United States, Great Britain, France, and Italy. These admirals divided the coast into zones.

The American zone, in which we were to maintain peace, ran from Cape Planka southward to Ragusa. Our naval force consisted of the cruiser *Olympia,* six destroyers, and two sub-chasers. Admiral Niblack arrived at Spalato on the *Olympia* on February

22, 1919, and established American naval headquarters in that city. A destroyer was generally stationed at Venice, Trieste, Fiume, Spalato, and Ragusa. These formed a radio chain, which insured good communications. In addition to the preservation of peace, these destroyers rendered splendid service, transporting relief workers with supplies and doctors. They were able to help stop epidemics and distribute milk to starving babies.

The task of preserving peace in Spalato required much patience and diplomacy. The feeling between the Italians and the Jugo-Slavs was very bitter. Fights and riots were frequent. In order to prevent these disturbances, the city was divided into four zones. An international patrol of four sailors (American, British, French, and Italian), under an officer of one of the four countries, was put on duty night and day in each zone. Our American patrol officer would be called, for instance, at midnight to rescue a Serbian soldier who, by mistake, had gotten into the Italian quarter, been arrested as a spy and was in danger of being shot. Again, the Serbians would throw an Italian in jail, which meant an all-night search of the various prisons and another rescue. To show the intense feeling, our naval patrol officer presided over a serious international court as the Italian sailor in a patrol charged the French sailor with an unneutral act—the act of throwing kisses to Jugo-Slav girls.

Although each nation had produce the other needed, the natural hatred, the insistence of one to discount the money of the other, the desire of the Italians to do business in lire and the Jugo-Slavs in kronen, prevented trade. Finally, our admiral got the commercial leaders together and they accepted his proposition that a merchant send a shipload of Italian sulphur to exchange for a cargo of Jugo-Slav lumber of equal value, with no exchange of money. Naval officers umpired this curious transaction, which resulted in a resumption of trade between the coasts of Italy and Dalmatia.

The raid and capture of Fiume by the Italian poet d'Annunzio caused great excitement in Spalato and rendered the maintenance of peace by our Navy very difficult. On September 23, an Italian Army captain, with three truck loads of Italian soldiers, dashed across the boundary into the American zone and captured the Jugo-Slav garrison at Trau. This looked like the start of another Balkan War, and called for quick action. Our senior naval officer present, Captain Boyd, dispatched a destroyer and two sub-chasers to Trau, got the Serbian Army commander to suspend an advance against the invading Italians, went personally to Trau in the *Olympia,* landed men there from our ships to preserve order during the withdrawal of the Italians and the entry of fresh Serbian troops.

The Navy is justly proud of its contribution to peace in explosive Dalmatia. One of our naval officers expressed the hope to a Serbian that war in this area had ended. Evincing surprise the Serbian replied, "Why! we will always fight in the Balkans—it is in our blood."

In South America

When the Brazilians asked our government to send them a naval mission, the invitation was accepted. European governments have sent army missions to Bolivia, to Brazil, and to Peru, and a naval mission to Chile. Other South American republics have engaged the services of ex-military officers. Chilean naval officers have made cruises in the fleet of a European power. Naval officers from Argentina, Peru, and Brazil have made cruises in our battleships, while others have learned to fly at our Pensacola Naval Air Station, and these officers are among the best friends the United States has in South America.

There is nothing new or novel for an old power to send military officers and civilian teachers to the newer countries. The United States, in our early history, utilized military instructors from Europe. As a member of our naval mission, it can be stated that we are disseminating in Brazil the ideas acquired during our training in the United States; we are endeavoring to carry out our country's peaceful foreign policies, are making friends, and are striving for peace here, as does the Navy throughout the whole world.

It is a pleasure to state that the Brazilians are preeminently a peaceful people, without designs on the territory of any neighboring country, but with a sincere desire to develop their own country, rich in natural resources, along modern lines. The United States should feel complimented that this young republic, born on November 15, 1889, has turned to us (instead of to Europe) for guidance in the development of the naval branch of the government.

The Far East

China.—The work of our river gunboat patrols in China is never-ending. In addition to protecting Americans and their interests, these patrols strive to maintain internal peace. Many a Chinese merchant has thanked our gunboat captains for driving off river pirates. Riots in the great international city of Shanghai, which is on the Wu Sung River just off the lower Yangtze, call for men from the bigger ships. The most difficult portion of the river to patrol is the upper Yangtze (a stretch of 400 miles from Ichang to Chunking, Ichang being 1,000 miles up the river.) There are some thirty-five rapids in the rocky forges of the upper Yangtze. The river pirates lie in wait in these gorges to attack ships as they are going through these difficult places.

Our merchant ships, and even our gunboats, are constantly being fired on by bandits. For instance, the American steamer *Robert Dollar II* has been boarded by 150 armed bandits, but they were driven off by over 300 bullets and two passengers were killed.

Many items in our reports from the Yangtze patrol read like this:

"On July 14, 1923, the *Pampango,* Lieutenant L. P. Lovett commanding, while escorting American ships was fired on by the Kwangsi soldiers, which attack continued until the *Pampango* returned the fire."

Lieutenant Lovett four days later, arranged for an armistice between General Gnai Bong Ping, who was about to attack Wushow, and General Wu Kwong Mat, who was going to defend the city.

The value of our trade with China (exports and imports) amounted to nearly $350,000,000 in 1923. Without naval protection, many of our missionaries and our merchants would be forced to withdraw from China. The Navy needs a new force of faster and more powerful gunboats for this Yangtze patrol, the construction of which Congress has already approved. Our Navy in cooperation with the patrols of the other great powers, must do its share in maintaining peace in the great Yangtze Valley.

Japan.—As our relations with Japan have been so much in the foreground, it seems appropriate to mention here, somewhat in detail, the action of our Navy during the terrible earthquake, on September 1, 1923.

At this time our Asiatic fleet, Admiral Anderson in command, was in Northern China. The fleet flagship (cruiser *Huron*), the destroyer flagship (*Stewart*), the Thirty-eighth Division, of six destroyers, and the tender *Black Hawk* were in Darien, Manchuria. On September 2 garbled news of the Japanese earthquake reached our forces. The admiral was convinced that the disaster was very serious, so ordered the destroyer *Stewart* to proceed to Yokohama. At 8:00 o'clock that evening the Thirty-eighth Division started for Japan.

In order to insure radio communication, in the event that all the Japanese systems had been ruined, the destroyer *Borie* was detailed to stop at Nagasaki and the *John D. Edwards* at Kobe. When the *Stewart* reached Yokohama she was able through this radio chain of ships, in connection with our naval radio stations in Peking, Shanghai, the Philippines, and the Hawaiian Islands, to reach Washington. All departments of our government in Washington used this radio chain during this disaster.

The flagship *Huron* went to Chefoo and took aboard all obtainable provisions; the *Black Hawk* went to Tsingtao for provisions; the Forty-fifth Division, of six destroyers, at Chinwang-tao, filled up with tents, blankets, and medical stores from the army at

Tientsin and from the marines at Peking; the naval oil tanker *Pecos* rushed to Manila, took oil, filled up with rice and other food stuffs, medical stores, lumber, hardware, and clothing; the tender *Abarenda,* up the Yangtze River at Hankow, took on board all available emergency and medical stores in the vicinity; while the navy purchasing officer in Shanghai put 10,000 tons of supplies aboard the shipping board ship *General Grant.* All these ships then started at full speed for Japan.

The *Stewart* reached the stricken city while the fires were still raging and anchored off Yokohama on the morning of September 5. The *Stewart* was the first foreign man-of-war to reach Yokohama. Later in the day the destroyer *Whipple* came in and went up to Tokyo, which was the the first time a foreign man-of-war had entered the Tokyo harbor in over seventy years. Destroyers were run on a daily schedule between Tokyo and Yokohama. The *Whipple* brought eighty-five women and children out of Tokyo at once: the *Smith Thompson* sent around the peninsula bringing back 150; while the *John D. Edwards* picked up foreigners as far south as Shimidzu.

Admiral Anderson arrived on the flagship *Huron* on the fifth and thereafter the ambassador and his family made their home on board this man-of-war. The Forty-fifth Division of destroyers and the naval transport *General Alava,* with medical stores, went to Kobe to do relief work. Enough supplies were turned over to our temporary embassy in Tokyo to care for 700 foreigners and 1,700 Japanese for three weeks, while additional stores were turned directly over to the Japanese and some to the French Ambassador for the embassy and a French convent. A tent-camp was erected in the embassy at Tokyo and another in Yokohama for our American consulate and American business men. Our naval mechanics were sent ashore to aid American business men to recover valuables and records. They recovered the contents from nearly fifty safes and vaults, one of which contained valuables amounting to $3,000,000. The Navy turned over supplies valued at $7,000,000 to the Japanese authorities with a promptness that increased the monetary value many times.

The Premier of Japan requested our ambassador to convey to our Government, and to our admiral the appreciation of the Japanese Government, and added that special representatives from the Japanese Admiralty were being sent to thank the latter in person. A Japanese publisher in Tokyo wrote to the admiral that his "prompt work appealed to the heart of every living Japanese," and that they were convinced of our great friendship for them.

Premier Yamamoto said to our ambassador and to our admiral: "Out of Japan's disaster has come a realization of the friendship of America in our hour of need. The prompt arrival of

the American Asiatic fleet and the way it took hold has been an inspiration to our people."

Thus has our Navy striven for peace with Japan.

After completing this remarkable piece of relief work that could have been done only by an efficient naval organization, our fleet, on September 21, sailed away to continue serving humanity wherever there was work to be done.

Agriculture and the Navy—Their Economic Relation

By Commander David C. Crowell (S.S.), U. S. Navy, *The Congregationalist*, 29 April, 1926.—Apart from patriotism and national pride, and considered only from a standpoint of purely material interests, what concern has the agriculturist in the existence of a navy? To what extent is he interested in a merchant marine? Have foreign markets any marked effect on his welfare?

These questions are more closely related than might appear at first sight, although their logical sequence is inversely as stated above. A condition of production beyond the requirements of domestic consumption resulting in a demand for foreign markets, then ocean carriers of some kind, this would be the chronological order of events indicating the need for the creation of a naval force, even if there were no other reason for its being.

The principles of foreign trade cannot be intelligently studied without some consideration of the broad economic relations existing among the trading nations; and the realization of this perhaps accounts in some measure for the recognized general increase in interest in international relations and foreign affairs in general.

Perhaps a good example of the changes which have gradually taken place in the relations between the United States and the other great countries of the world may be found in visualizing the growth of the earliest settlements in pioneer days. First, a little community springs up, which requires for its maintenance the bringing into the community of practically all of the necessities of life. Then as the natural resources of the community are exploited, certain of the material needs of the community are supplied through primitive systems of barter. Presently, the production of certain commodities increases beyond the consuming power of the immediate community and an outlet for the surplus is required, and trade relations are entered into with nearby communities. This breeds a desire for a knowledge of commercial conditions in the possible purchasing communities and creates a demand for some kind of transportation. Shipments may first be made by wagon, train, or perhaps by water, should the producing community be fortunately located in this respect. The physical means of transportation in turn calls for security, perhaps obtained in the shape of some kind of a police force.

Obviously, the protection force should be strong enough not only to repel any attacks on the transportation line but to prevent, by virtue of its potential power, any disturbing attempts of the kind.

As the producing community grows and prospers, its trade spreads out like the spokes of a wheel, and as those of other communities do likewise, although perhaps trading in different commodities, we soon find a seemingly complicated state of affairs with conflicting interests and rivalries apparently inseparable from such conditions, when enterprising and aggressive peoples are all keenly interested in progress—in the natural pride and interest in their own communities, and in the equally natural interest in their own material welfare.

If we substitute for the small communities, other nations, of different races, conflicting interests and keen economic rivalries, we have a crude picture of the world's economic life, so far as international trade is concerned.

It follows that the viewpoint of the producer will adjust itself with the new situation. At first material interests are all close at home, but by degrees he finds it necessary to extend his thoughts farther afield, so that they may keep pace with the product he has to sell.

If he cannot place all of his products in his own country, he naturally acquires an interest in foreign markets, in carriers for his goods and in some kind of police force or other insurance feature to guarantee their safe arrival at their destination.

A very brief reference to official records suffices to determine the extent to which the agricultural interests are dependent upon foreign markets.

The value of our domestic exports of all kinds of merchandise is about four and a half billion dollars. The value of exports of raw cotton, wheat and flour, tobacco, meats, fruits, rye, and corn amounts to nearly two billion dollars, and other agricultural products bring this sum to nearly half of the total exports. More than one-sixth of the value of all agricultural products find their sale in foreign markets, and the proportion of foreign sales of certain commodities reaches a much higher figure. During the past few years, the foreign shipments of raw cotton have ranged from one-half to four-fifths of domestic production of wheat and flour, from one-fifth to one-third and of tobbacco from one-third to two-fifths. Besides the great trade in raw cotton, a considerable trade is carried on in cotton goods manufactured in this country, and the same holds good in the case of other manufactures of home produced raw materials. Thus the agricultural interests have a greater concern in foreign markets than has any other industrial group. Not only is this so, but range of products is so wide that practically all sections of the country are intimately affected—not alone the actual producers, but also all of

those who are in any way connected with the manufacture, sale, or distribution of articles manufactured from native-grown materials, and ultimately destined for export.

In order that the surplus commodities may be sold abroad, there must be ships to carry the goods, operating either under our own flag or that of some other country.

There is one very important difference between domestic or national transportation, and that of an international character, such as the carrying trade between different countries. So far as the purely domestic interests of the shipper are concerned, it does not make a great deal of difference to him or his business whether the railroad which transports his goods is owned and operated by the government, by private capital, or even by foreign capital. His primary concern is in the nature of service rendered and the cost. But it does make a great deal of difference, as between over-seas transportation lines, whether those lines are operated under the flag of his own country or that of some foreign power. This difference is always existent to some degree, although in a state of world-wide peace, not only in the usually accepted sense, but complete economic peace, if such a condition can be imagined—it may not be clearly distinguishable. But as soon as there is a break in peaceful relations, the nation depending upon a foreign merchant marine for the transportation of its goods to markets beyond the seas, finds itself in an embarrassing situation. If the main dependence has been placed on ships operated under the flag of another nation now in a belligerent status, its trade is at once affected. The belligerent nation will then withdraw its ships in greater or less degree, depending upon its own needs, and upon the relative naval strength of its adversary. In the first place, its material needs are enormously increased, and this calls for more shipping; again it will not be disposed to expose its ships to undue risks for the mere immediate money advantages which are the end in view in the case of peace-time maritime operations. And again, but not least in importance, all nations necessarily depend to a very great extent upon their merchant marine for the numerous auxiliary ships necessary to round out their naval forces in time of war. This, of course, is one of the reasons which make it a matter of importance for all major powers to maintain under their own flag an adequate merchant marine, rather than to consider the over-seas carrying trade a purely economic affair, to be thought of only in terms of the immediate dollars and cents return.

If a nation possesses an adequate merchant marine of its own, it is fortunate, but it cannot hold its foreign trade in time of war unless it also has correspondingly adequate protection force. History is full of examples of this kind. What happened to

the great sea-borne trade of Germany during the late war is still fresh in our minds.

To go back to early times in our own history, a glance at conditions in the early part of the nineteenth century is illuminating, taking in a period of disturbed conditions and one of actual war. in 1814 our foreign trade had climbed to about seven per cent of what it was in 1807. We did not have a police force strong enough to compel respect for our rights, and we had to pay the penalty.

It is not only belligerents whose interests suffer. The lessons of the late war will not be forgotten, and in a life and death struggle between two or more major powers, the commerce of the neutral will be subjected to such restrictions and control as are made possible by the power of the belligerents.

To sum up, the agricultural industries require foreign markets in order to dispose of those products which cannot be sold advantageously within the limits of the home country, a merchant marine is required to transport these products to the foreign consumer; and the defensive power of a merchant marine being negligible, naval strength is needed to insure, by its potential power, the uninterrupted course of commerce.

An American Flag Merchant Marine Is Essential and Inevitable

By Brigadier General A. C. Dalton, *The Nautical Gazette*, 21 August, 1926.—"Essential over-seas foreign trade routes must be kept open and active for American commerce by American flag merchant steamships built in American shipyards." This is the unequivocal declaration of policy stated by Brigadier General A. C. Dalton, president of The Emergency Fleet Corporation, to *The Nautical Gazette* at a special interview accorded in Washington this week. On the shipbuilding aspect the general was equally firm. "These essential trade routes," he said, "must be held by sheer merit; by ships equal in every respect to the best built foreign vessels and as tonnage becomes obsolete it must be replaced with modernized vessels to suit the special demands of the particular routes served.

Must Reaffirm Policy

"There are several important factors which are quite clear even to the lay mind, it seems to me," continued the general, "and I think one of the most important steps we have to take will be the revision of our Merchant Marine Act and the reaffirmation of our merchant marine policy which should be so clearly and so definitely stated that it may not only assure our own people of what the national policy will be with respect to building up and maintaining our American flag merchant marine, but will also serve as a definite notice to other maritime nations of the world

that it is the intent and purpose of the United States to establish an American flag merchant marine service that will be commensurate with the volume of our over-seas traffic and in keeping with the commanding place that the United States must maintain in international commerce if we are to continue to have that degree of prosperity we have had in the past.

Consider Rights of Other Nations

"In establishing a merchant marine service for the nation we must naturally give due consideration to the inherent rights of other nations and we cannot demand that we shall have a greater share of the over-seas carrying trade of the world than our position among the other nations of the world would warrant.

"Our own prosperity, and particularly our participation in the great international commerce of the world, must depend to a very large degree on maintaining the good will of other nations engaged in the same activities.

"There are certain trade routes in the world which are absolutely essential to us and we must maintain American flag vessels of the proper type and suitable tonnage on these trade routes to render a service to our people in their commercial activities. There are other trade routes of the world not particularly essential and we naturally must leave control of those trade routes to the nations to whom they are of the most value and importance. In the extension of our merchant marine program we must give as much consideration in this respect as we will demand from other nations in the trade routes that are essential to us.

"The initial step in arranging the program of our merchant marine must, therefore, be a careful study of the trade routes of the world, and a special survey of those that are essential to us. In making a study of those trade routes essential to us we must consider the volume of traffic, the character of the traffic, and the types of vessels that are necessary for the United States merchant marine, to insure that under the ordinary rules of supply and demand we may be able to render the kind of merchant marine service that our nation requires.

Types of Vessels Required

"There are many factors to be considered that are secondary in character but of primary importance. The first factor is what kind of vessels are necessary to carry on the passenger and freight traffic to and from each of the areas of the United States that must be given an over-seas transportation service. With the widely varying character of our products, and the commercial requirements of the different sections of our country, an intensive study is necessary in order to make the program effective for each area.

"For example, the character of the exports and imports of the great northwestern area will differ considerably from those of the great northeastern part of the country. There are certain ports and routes that serve certain areas. To use another term you may define these areas as the 'hinterland' lying behind ports, the physical conformation of the country, and the inland transportation system dictates the ports and the trade routes. For that part of the program for the building up of a merchant marine that will solve the commercial needs of our people in the great interior areas, where it is essential that some form of government aid be given, it is necessary to convince our people in the various sections of the country, and particularly in those areas that are remote from the ports or points of over-sea shipments, of the necessity for the maintenance of an American flag merchant marine to render to the nation the character of service that is imperative to enable their surplus products to be moved to foreign markets in the most direct manner and at the least possible cost for transportation.

Cites Gulf Grain Movement

"A recent example of American flag shipping is the great grain movement by utilizing shipping board tonnage from the southern and gulf ports, whereby the movement of grain for exports has kept pace with the production and delivery of that grain to the ports. The shipping board vessels were able to accomplish this and render a great service to the farmers of our Middle West during the past sixty days. At the same time that we were shipping this grain there was a serious congestion in Montreal of grain available for export. Over 15,000,000 bushels were in Montreal awaiting over-seas shipment, while all elevators were full, lakers fully loaded, and a great number of grain cars rolling toward the Canadian ports. Had not the shipping board come to the front and given this service there would have been a similar congestion in our southern and Gulf ports. The American farmer who has been able to ship his grain through the southern ports will profit by the present high prices for grain to an extent that would not have been possible if he had been forced to wait until the market was flooded by the great northeastern grain movement. This is cited as showing the inestimable service a government-regulated merchant marine can render to our people: a service that will repay them many times over for the actual cost.

"An American merchant marine must be created, primarily, as the final link in the greater national transportation system. We have a highly efficient inland and domestic transportation system which is ample to care for our domestic requirements, and to move to tidewater all of our exports and from tidewater to distribute inland all of our imports. But the most efficient domestic transportation system will be greatly reduced in its importance in

maintaining our commercial prosperity if the final link—an Amercian flag merchant marine—is not sufficient in volume, or suitable in character, to render an efficient and economical service in making the final movements of our imports and exports that must complete the cycle of our national transportation system.

Billions for Other Transportation Systems

"We have spent hundreds of billions of dollars and are spending annually huge sums in maintaining and perfecting our domestic transportation systems. A great national highway building program, which when completed will be one-fourth greater than the national highways of all the other nations combined, is receiving an annual aid from the federal government of approximately $85,000,000. The appropriation for improvements of rivers and harbors, canals, and inland waterway services is about $75,000,000 per annum. Our great reclamation projects are carried on at the expense of the government at a cost of many millions each year, and the ultimate expenditure will run to hundreds of millions. Our Interior Department is expending large sums from federal appropriations for the establishment of commercial agencies for gathering and distributing information respecting foreign markets and world trade conditions.

"Our great railroad transportation system received enormous sums in federal grants of public lands, and through bonds federal aid, as encouragement for railroad promoters and builders to provide a national railroad transportation system adequate for the requirements of our people.

Logical to Aid Shipping

"It would appear reasonable and logical that the people of this country should contribute in like manner to the development of an American flag merchant marine in order that this great final overseas link in the national transportation system may be finally established and properly equipped to render an economical and efficient service, for the development of our overseas commerce that is so vitally essential for the prosperity of the nation.

"The growth and development of our country has been made possibly by reason of the fact that the basic principle upon which our great republic was founded was to give to the individual every opportunity to exercise his individuality, initiative and resourcefulness in the conduct of his business and to profit thereby with as little restriction or supervision over his activities by government regulation as the interests of the public would make possible. In the development of the several groups of our domestic transportation system this initiative, enterprise and resourcefulness has been encouraged, and it has been the policy to permit the fruits of their enterprise to fall to those who have been pioneers

in the transportation field. In the upbuilding of a great American flag merchant marine this principle must still prevail, and private enterprise must be left free to operate in this field. The development of an American flag merchant marine on trade routes in which vessels can be privately owned and operated must be left to private capital and enterprise. The highly competitive character of the merchant marine service, and the advantages which have accrued to other nations by reason of lower wages, cheaper costs of operation, lower building costs, and direct or indirect financial aid and support which has been given to private shipping interests by their governments, make it imperative that on certain essential trade routes there must be given some aid to American flag shipowners and operators by the people of the United States if we are not to surrender the control of those essential trade routes entirely to foreign flag interests.

Form of Aid Perplexes

"The most perplexing problem in evolving a program for an Amercian flag merchant marine will be the method by which aid may be given to owners and operators without such aid appearing to serve private interests, even though those private interests may be rendering a great service to the nation as a whole. There is a well defined opposition on the part of the people to the giving of aid to private enterprises wherever it is not clear that the giving of such aid is not serving a private rather than a public interest. This hesitation on the part of the people of this country to give some form of support to the maintenance of an American flag merchant marine in the past has been largely due to a lack of understanding knowledge of the vital effect an American merchant marine will have in the development of our foreign trade relations, the establishment and maintenance of markets for our surplus products, and the advantages which would accrue by having our exports and imports carried in American flag vessels.

Why Shipping Needs Were Overlooked

"This hesitancy on the part of our people has also been largely enhanced by the fact that during the period of our greatest national development we had practically no American flag merchant marine engaged in extensive overseas shipping activities. The necessity for an American flag merchant marine was first brought home to our people by developments of the World War when foreign flag vessels were largely withdrawn from essential trade routes to serve the war requirements of their own countries. The nation, however, became so quickly engrossed in the problems of the war that the real significance of this condition was not generally comprehended or understood. To meet the peculiar requirements of the war an intensive shipbuilding program was inaugu-

rated and at the close of hostilities America found itself with a large number of ships on its hands.

"The development of the war also caused a great increase in our industrial establishments and the productive capacity of these industrial establishments greatly exceeded our domestic demand. The delay in their industrial re-establishment by many of the other nations, and the consumption of much of their surplus stocks of raw materials to meet the demand of the World War, removed from immediate competition several of the great nations of the world, so that immediately following the World War, there was a large demand for the products of American industrial establishments, and the newly-fledged government controlled American merchant marine enjoyed for a brief time an unusual prosperity. The industrial rehabilitation of the other nations, will soon, however, make them dangerous competitors to the United State in the industrial field.

War Changed World Markets

"The world markets were entirely changed as the result of the World War. Trade connections, trade credits, and trade relations in general, were left in a more or less chaotic state. This post-war condition has demanded a re-survey of the trade conditions in practically every quarter of the globe. Certain nations have become more self-dependent and are manufacturing articles that formerly they obtained by importation from other countries. The gradual restitution of industrial establishments of those countries who suffered most severely from the war, and the decreased demand in certain trade markets for articles produced in other countries, will naturally bring about keener competition beween those nations of the world that have maintained or are maintaining and building up their industrial establishments.

"The United States is becoming more and more dependent upon foreign trade, not only for markets for our surplus products but for essential imports that are vital to supply the wants of our people. An analysis of the imports and exports for the fiscal year of 1924 shows that the value of all the essential imports comprising sixty per cent of the total was approximately two and a quarter billion dollars, and that the corresponding sixty per cent of exports totaled approximately the same amount.

"The great increase in the volume of our exports, the necessity for finding a market for our surplus products and the ever increasing volume of our essential imports, renders it a vital matter that the means of transportation by which this great volume of trade must be moved be owned and controlled by the American people to such a degree that we may not lose command to such an extent that other nations who are competitors in world trade shall be able to shut off our communication with the world's markets.

"The merchant marine problem has in the past been largely local and the solution has been largely left to the shipping interests who were the most vitally affected. This problem has ceased now to be a local matter and must be regarded as a national problem. Its final solution must be worked out in such a manner that the interests of the nation and the people of our country shall be served and benefited. The establishment of an American flag merchant marine as a national venture is inevitable.

Shipping Must Not Fail

"We have reached a stage in our industrial development and world trade relations that will not admit of failure in our shipping policy unless we are to lose that commanding position to which as a nation we are entitled.

"The solution of the problem would appear to involve—First: Re-affirmation of our merchant marine policy by Congress with the full support of our people. Second: Careful study and analysis of world trade conditions, and definite determination respecting the trade routes upon which it is essential American flag merchant ships shall be maintained. Third: Formulation of some plan by which government aid may be given toward building up an adequate merchant marine composed of vessels specially adapted for the service required on each of those essential trade routes.

"America has led the world in the field of industrial mechanics and American industrial genius has produced machines and machinery capable of quantity production of practically every article or commodity that is essential, at a price that has enabled American manufacturers and producers to compete with the cheaper labor and material costs of other nations of the world. American mechanical genius can therefore produce American-owned vessels that will be manned by American seaman, operated by American skill, and that will favorably compete with the merchant marine services of any other nation of the world.

"The building program which is so essential must be worked out by utilizing the genius, ability and experience of our shipbuilders, shipowners and operators, under the general co-ordination and supervision of such government agency as may be established by Congress. The government agency that now exists is the United States Shipping Board, and it has been charged by the Jones resolution to submit to Congress not later than January 1st, 1927, a definite program for an American flag merchant marine.

"The financing of a great building program, and the method by which financial aid may be given to private shipbuilders and operators in the actual construction of merchant marine vessels, is a more difficult problem than the mere determination respecting the numbers and types of vessels to be constructed. Too great a burden must not be immediately placed upon our people

by way of an increased annual national appropriation. Future generations will receive the greatest benefit from this great effort and the plan of financing should provide for a suitable distribution of this burden among the people over a long period of years.

Shipbuilding Must Not Be Delayed

"Initiation of a building program, however, will no longer admit of delay. Vessels of the American merchant marine now engaged in overseas trade are inadequate in number and largely unsuitable in type and class for the service that should be rendered. Other nations have undertaken extensive building programs since the World War and have produced modern mechanical ship units of a type and class that make it impossible for our war-built and war-acquired fleet to successfully compete with them, particularly when the American merchant marine is handicapped by the cheaper cost of operation and maintenance of the vessels of other nations.

"Our building program must, however, be far-visioned and must not be based solely upon present trade conditions, but must look forward to the development of future years, both in regard to the ever changing trade conditions and the rapid advancement in industrial arts and mechanics.

"American shipbuilders must be cautious about too soon adopting some of the newly developed types of propulsion, and the newer types of ship units, until it has been assured that they will meet the expectations which their designers and builders have formed."

General Dalton has acquired a general knowledge of practically every activity pertaining to vessel operation, either ashore or afloat. In addition to marine activities he has been identified with the general transportation activities of the Army for many years. He served as chief of the transportation service, Office of the Quartermaster General, from 1922 to 1925. At the time of his relief he was chief of the construction service, Office of the Quartermaster General, which supervised all real estate transactions and building activities of the Army. General Dalton was born in Indiana in 1867. He enlisted in the Regular Army January 18, 1889, and has been continuously in the military service to the present date. Although born in Indiana, he has been identified in New York for the past twenty years and has adopted New York City as his legal residence.

GREAT BRITAIN

After the Naval Holiday

Naval and Military Record, 11 Aug.—Specialist officers have been appointed to the new British battleships *Nelson* and *Rodney*. This shows that it will not be long before these two vessels enter upon their trials. Press comment on this fact has naturally in-

cluded suggestions that the *Nelson* and *Rodney* will be the last battleships in the present limited sense of the term to be built for any navy.

The conditions of the Washington agreement have now been observed by the great naval powers for five years, and five years more must elapse before the end of the naval holiday is reached and the nations are free to develop their material resources in a natural manner, unhampered by arbitrary rules. So far the result of the naval treaty seems to be the elimination of competition in the battleship class and the institution of an equally fierce competition in cruisers and torpedo craft, whose numbers are not limited by the treaty. The battleship has been put back a stage in development, and it is questionable whether she will ever again appear in the same form. The present generation of capital ships will, no doubt, remain for their allotted span, but it is very doubtful whether any more ships of war will be designed as battleships pure and simple.

The plain fact is that the battleship has become too large and too expensive. Nations will think twice before expending huge sums on a type that is designed to do but one job, however well it may do that job. It is far more likely that we shall see the development of a hybrid type incorporating the heavy caliber armament and size of a battleship with the aircraft capacity of the orthodox carrier. There is nothing impossible in such a type, and the merging of the two types—battleship and aircraft carriers—is one of the most likely results of the lifting of the Washington restrictions.

Battleship-Plane-Carriers

In the 1926 volume of *"Brassey's Naval and Shipping Annual"* Sir George Thurston described designs for a type of battleship-plane-carrier, which combined many of the features of the battleship with the advantages of the aircraft carrier. In preparing these designs he had in mind the Washington tonnage limitations, and therefore kept his dimensions as low as possible. This limitation will, I think, always remain, not on account of international agreement, but because of international disinclination towards unnecessary expenditure. The design put forward by Sir George provides for a ship of 28,000 tons, and a speed of 26½ knots. The armament is to be either six 16-inch or nine 12-inch. The 12-inch armament was intended for a vessel for the navy of a South American republic. The ship was to be armored with 10-inch plating on her sides and 12-inch barbettes. Thirty planes were to be carried and there was to be a "sky-battery" of ten 4.7-inch anti-aircraft guns.

In appearance, Sir George Thurston's battleship-plane-carrier was to be very like the *Furious* in general line of hull, but with two triple turrets forward to take the primary armament, and with a

ledge all round the flying deck for the secondary anti-aircraft battery. The flying deck was to be completely unobstructed, the funnels being suppressed altogether and replaced by discharge chutes in the sides of the ship amidships. The bridge and gunnery controls were to be mounted on the starboard beam in the same manner as those of the *Hermes* and *Eagle*.

This type would combine the advantages with those of the aircraft carrier, while keeping to a reasonable displacement. If it was found necessary to build a more powerful vessel there is nothing to prevent nine 16-inch guns being mounted. This addition to the primary armament would, however, raise the displacement by nearly 10,000 tons.

A similar type of vessel was suggested to me by a student of naval design with whom I was talking the other day. He preferred a shorter, slower, and more heavily-armored type of ship, with a small displacement. His design, while it had the six 16-inch guns of the Thurston design, provided for the launching of planes by means of a catapult, and moreover, carried only twenty aircraft. This ship was to displace 27,000 tons, and was to be armed with six 16-inch, eight 6-inch, and eleven 4.7-anti-aircraft guns, was to be armored with an 11-inch belt over the boiler-rooms and magazines, and was to have two funnels abreast at the extreme sides of the ship amidships. The bridge and tower-mast formed a "marble arch," as my friend termed it, through which planes could be run on to the catapult which was placed between the bridge and second turret. The secondary guns were to be placed amidships, and the anti-aircraft battery on the foc'sle and in various other positions forward and amidships. Two guns were arranged so as to command the flight deck, the reason given being that an armored enemy aircraft might land on the aft end of the flight deck under cover of dusk or a smoke screen and make the flight deck untenable by means of machine-gun fire. The flight deck would then be damaged by small bombs. To provide against the possibility of such a forlorn hope on the part of the enemy—for the attacking plane would certainly never get away again—two high-angle guns in stout shield with covered access provided, were fitted to command the deck abaft the funnels.

The tendency towards the incorporation of the features of the aircraft carrier would certainly not stop at the battleship. Large cruisers would appear, with their after-part devoted to aircraft and carrying a battery of 8-inch guns forward. To counter these, light battle cruisers of about 20,000 tons, with 12-inch guns and a more numerous complement of aircraft would probably be constructed.

The aircraft carrier, as we know her to-day, will not, I think, survive as a type. There are so many reasons why she would be better combined with the older types that there seems to be no reason for continuing her as a separate type.

Naval Types After the Holiday

When the naval holiday is at an end, will the navies of the great powers continue to be composed of the present standard types of warships? Largely, I think this will be the case, but with many important modifications. The aircraft carriers, in my opinion, will tend to die out, or rather to become merged in the battleship and cruiser types. Otherwise the types will remain, but certain of them will multiply and divide into sub-classes, and others tend to be eliminated. Cruisers will probably undergo considerable changes, having exchanged their function of the "eyes of the fleet" for that of attacking and protecting commerce. It is unlikely that the same type will suffice for both duties. In the first place the speed which is a feature of the commerce raider is unnecessary in a vessel whose duty is to beat off attacks, and moreover, the displacement is better expended in a more numerous armament.

Destroyers will probably increase in size to a displacement more nearly approximating to that of the small cruisers of the Great War. An example of what can be done on this displacement (3,000 tons) is shown by the Japanese cruiser *Yubari,* which, I think, would be found to be much akin to what the destroyer or flotilla leader will become. The torpedo duties of the destroyer will no doubt be taken over by an improved form of coastal motor boat or motor torpedo boat, carried by specially adapted small cruisers. In the submarine classes, the present types, flotilla boats of about 1,000 tons, minelayers of the same, and a few larger boats for service with the battle fleets. The last-named class are never likely to be numerous, for the opportunities for their employment are rare. Cruiser-submarines of 3,000 tons are not likely to be further developed. Their tactical use is obscure, their size unwieldy, and their armament too weak to cope with a surface cruiser.

The Fleet Fifteen Years Hence

Of what, then, will the fleet consist? In my opinion, the following types will form the active forces of the navy:—

Battleship-plane-carriers (28,000 tons, replacing present battleships).
Light battle cruisers (20,000 tons plane-carriers).
Heavy cruisers (11,000 tons).
Heavy cruisers (14,000 tons. 33-knot plane carriers).
Flotilla cruisers (3,000 tons. Replacing present destroyers).
Flotilla cruisers to carry C.M.B.
Flotilla and large cruisers, fitted as minelayers.
Fleet submarines.
Minelaying submarines.
Minesweepers.

Convoy protectors (11,000 tons. fourteen 8-inch guns, low speed).

Disguised convoy protectors.

This list will probably be considered by many to be utterly incorrect and unlikely. I shall be glad to hear other ideas on the subject. Too much interesting opinion on such topics is wasted in the restricted area of private conversation. It is to the good of the service and of ship construction that such matters should be made public.

Naval Aviation

Engineer, 6 August.—To say that aviation is destined to play an important part in future warfare at sea is to utter a platitude. Aircraft have already become an integral component of every well-balanced fleet, and their unique value has been demonstrated in actual war operations. In the development of this new arm the British Navy may claim to have led the way. While there is some doubt as to whether an airplane was first flown from the deck of a British or an American man-of-war, it is not disputed that we were the first in the field with the aircraft carrier, which has made possible the remarkable progress in naval aviation. At the beginning of the war several cross-channel steamers were converted into airplane carriers, one of which did useful service at Jutland. Then the Cunard liner *Campania* was fitted with a flight deck, from which machines could take off, though they were unable to make landings on it. The next stage was the conversion of the light battle cruiser *Furious,* which became the prototype of the modern carrier. She proved a great success, and it was from her deck that the most successful naval air attack of the whole war was launched, when a flight of machines bombed the German airship sheds at Tondern, destroying two Zeppelins. Meanwhile, the Admiralty had purchased the Chilean battleship *Cochrane* and the Italian liner *Conte Rosso,* lying unfinished in British shipyards, and caused them to be rebuilt as aircraft carriers, under the respective names of *Eagles* and *Argus.* Finally, in January, 1918, the *Hermes* was laid down, she being the first ship in the world to be designed *ab ovo* for the transport of aircraft. Since the war the two battle cruisers *Glorious* and *Courageous* have been taken in hand for conversion. The result is that we now possess a fleet of carriers of which there is no counterpart in any foreign navy. Excluding two that are obsolete, it consists of six vessels, ranging from 10,550 to 22,600 tons. The *Argus*—the slowest unit—has a speed of just over 20 knots; the *Eagle* is good for 24 knots; the *Hermes* for 25; and the *Furious, Glorious* and *Courageous* for 31 knots. The combined aircraft capacity of these six ships is not definitely known, but it cannot be less than 160 machines.

Turning to other navies, the United states is first with two very large carriers, *Lexington* and *Saratoga,* originally begun as battle cruisers. The displacement is 33,000 tons, the designed speed 33.34 knots, and the stowage capacity seventy-two airplanes per ship. Unlike our carriers, which mount nothing heavier than 6-inch guns, the American type is very powerfully armed, having eight 8-inch 55-caliber guns in twin turrets, twelve 5-inch quick-firers on high-angle mountings, and four torpedo tubes. It is, in effect, a composite type, half battle cruiser and half aircraft carrier, its combatant character being further emphasised by substantial belt armor and bulge protection. Japan is pursuing much the same policy. Her largest carrier, the former battle cruiser *Akagi,* of 27,000 tons and 28.5 knots, mounts no fewer than ten 8-inch and sixteen 4.7-inch guns, and it is understood that the *Kaga,* an ex-battleship, of 26,900 tons and 23 knots, will have a similar armament. It will be seen that H.M.S. *Eagle,* our largest ship, is smaller by 10,400 tons than the American type, and is considerably lighter than the Japanese vessels. In British naval circles, however, the utility of such monster ships is questioned. Logically considered, the carrier is not a fighting ship but an auxiliary; her prime function is to furnish a floating base for aircraft working with the fleet. Being peculiarly vulnerable to gunfire and other methods of attack, she should keep as far away from the enemy as is consistent with the performance of her special duties. Otherwise, the necessity of affording her protection will impose a serious burden on the fighting ships proper. Moreover, the sinking or disablement of a carrier such as the *Lexington* or the *Akagi* would be a disaster of the first magnitude, since it would deprive the fleet to which she belonged of half its air force at a single blow. Hence the preference in this country for carriers of moderate dimensions, such as the *Hermes.* The reconstruction of such comparatively large vessels as the *Glorious* and *Courageous* is probably dictated by motives of economy. Had funds been available, new ships of smaller tonnage would doubtless have been laid down. But, although American policy with regard to carrier dimensions may be open to criticism, there are other features of aviation development in the United States Navy which seem to us worthy of emulation. We refer particularly to the principle of supplying aeroplanes to every type of vessel capable of carrying them. According to recent information, every American battleship in the fleet now carries one scout and two combat machines, and each cruiser two scouts. They are discharged from the ship by means of catapults. During the visit of the United States light cruiser *Memphis* to Gravesend this month we had an opportunity of inspecting her aircraft equipment. The two seaplanes were stowed amidships, each on its own catapult. Certainly they occupied a good deal of deck space, but

their presence did not seem to interfere with the effective working of the ship or her armament. We were informed that flying exercises were part of the ordinary routine of training, and that no difficulty was experienced in launching the machines in normal weather. They are propelled from the catapult by an air blast at a velocity of sixty miles an hour. On returning from the air they alight on the sea as close to the ship as possible, whence they are hoisted in by the derrick. By constant repetition the operation of launching the machines and recovering them from the sea has been brought to a high standard of efficiency. Seaplanes of a diminutive type have been designed for the use of destroyers, and twenty of these boats now carry one machine apiece. Even submarines have been experimentally fitted with tiny seaplanes. In all, something like a hundred aeroplanes are now distributed among the ships of the United States Navy, in addition to those borne in the carriers. The battleships use their aircraft chiefly for "spotting" purposes, and are thus able to acquire practical experience in long-range indirect gunnery. Cruisers detailed for patrol or reconnaissance must find their aircraft invaluable. Had our cruisers been equipped with aeroplanes on the outbreak of war, it is virtually certain that all the German raiders then at large would speedily have been laid by the heels. The career of the *Emden, Karlsruhe,* and others would have been numbered by weeks or even days, instead of by months. At that period, however, reliable aircraft for use on board ship had not been evolved, and so our cruisers had to dispense with what would assuredly have proved an adjunct of priceless value. But by now the most technical difficulties have been overcome, and it is to be hoped that the Admiralty will not be behindhand in providing aircraft for such of our warships as could employ them with profit, that is, battleships and cruisers.

The American Navy enjoys one marked advantage: it has absolute control of its air branch, which is thus organized strictly in accordance with naval needs, no other department having a voice in the matter. In time, as we hope, this rational system will be introduced here, and the navy's flying service divorced from Air Ministry control, which acts as a drag on the wheels of progress. Convincing evidence of the importance attached to aviation by the American naval authorities is afforded by recent legislative action. A bill which passed through Congress last month, and has since become law, authorizes the expenditure of £17,000,000 on the naval air service during the next five years. It provides for the construction of 1,947 new airplanes and the maintenance at all times of an effective force of not less than 1,000 machines. Lighter-than-air craft are to be represented by two rigid dirigibles, each to be three times as large as the ill-fated *Shenandoah.* Not the least important section of the bill is a clause

which creates the post of Second Assistant Secretary of the Navy, whose sole duty will be the administration and supervision of the air arm. It is further enacted that every officer appointed to command an aviation school, a flying station, or an air unit shall be a qualified aviator. Thanks to this far-reaching measure, the future of the American Navy's air service would seem to be assured. On the other hand, though the present strength of the British Navy in aircraft is difficult to estimate in the absence of reliable figures, we believe we are correct in describing it as inadequate even for the needs of the moment. There should, we submit, be enough machines on hand to fill up all available aircraft carriers to capacity and to provide at least two for every battleship and at least one for every cruiser on the active list, with a literal margin in reserve. No doubt the Admiralty is doing its best to attain this standard, but there are obvious difficulties in the way, not the least of them being the well-meant efforts of the Air Ministry to balance the conflicting claims of the navy, the army and the Royal Air Force itself. We shall not presume to decide between the claims of these respective services, but we are definitely of opinion that the formation of an adequate and autonomous naval flying corps is a national requirement of capital importance.

Fleet Air Arm Officers

Naval and Military Record, 18 August, 1926.—An admiralty order lays down that attachment to the fleet air arm will not render naval officers ineligible to qualify as specialists in other branches. Officers who have completed period "A," which lasts four years, may apply to be selected for training as specialists. From this it would appear that the Admiralty take the view of aviation is very much a young man's job, and that candidates for the fleet air arm should not be discouraged by a feeling that may find they have sacrificed other opportunities when they revert to general service. But flying of itself is quite as much specialist work as submarine service, or gunnery, or torpedo duties. It is, of course, true that the proportion of officers required for auxiliary duties is comparatively small, and that when the major of flying men have reached the limit for "going up" they are of no further practical service in the fleet air arm. But is not the present tendency to fix the "going up" limit unnecessarily low? The question is difficult to determine, for flying depends purely upon personal fitness, and in this respect no two men are quite alike.

While it may be desirable to establish a general rule as to the duration of service for a flying officer, it seems to us to be no less desirable that this should be applied on the most elastic principle. otherwise it must often involve dispensing with the services of an airman at the concert pitch of his efficiency and experience. It may be said that the same principle applies to all branches of the

service. But this can only be true in a widely different degree. The retiring age limits for senior naval officers are fixed at an age when, normally, a man has done his active life work. Conversely, in the junior ranks, the retiring age limit is determined by the consideration that if a man has not got beyond the rank he holds at the age when he is due to go the service can well spare him. These conditions can scarcely be applied to flying. The assumption is that steadiness of eye, strength of nerve, and daring of purpose are the monopolies of youth. As a general doctrine this is true. But seeing that the scientists tell us that a man's expectation of life these days is about twenty years longer than it was half a century ago, it seems reasonable to conclude that the youthful stage lasts longer than it did when the world formed its conclusions upon the subject.

Naval Reductions

Army and Navy Air Force Gazette, 7 August, 1926.—Considerable attention has been aroused by the announcement, recorded in these columns three weeks ago, that twenty more vessels of the Royal Navy are to be removed from the effective list during the financial year. That there should be room for the scrapping of another score of vessels, after the ruthless cutting down and the continuous weeding out which has been in progress for over seven years, naturally raises a doubt in the mind of the public as to the wisdom or safety of the measure proposed. Yet the effect of what is to happen has already been discounted in advance. Four of the twenty ships are the battleships of the *King George V.* class which must be demolished under the Washington Treaty, and in place of which Great Britain was allowed to build the *Nelson* and *Rodney.* A fifth vessel is the ex-battleship *Agamemnon,* which for the last five or six years has been on subsidiary service only as a target-ship. It is different with submarine *L-9,* completed in 1918, and why this vessel is singled out for scrapping, while the eight vessels built ahead of her remain, is not revealed. The other units in the list are destroyers of the Admiralty *R* and *S* classes, ranging in point of age from the *Radstock* and *Raider,* begun in 1915 and completed in 1916, to the *Sikh,* begun in 1917 and completed in 1918. It is nearly a year ago since the scrapping of these vessels was foreshadowed.

The step now being taken is a natural sequel to the adoption last year of a program of construction covering the financial years 1925-26 to 1929-30. As Mr. Bridgeman said during the navy estimates discussion, it was not realized until the question of these savings was taken in hand what an enormous difference it makes having a fixed program, and knowing how the material of the navy will stand not only one year but four years hence. The great majority of the economies which have been made since last

summer, and of which the sacrifice of destroyers, still with years of useful life in them, is one, would not have been possible without that fixed program. If the Admiralty know what replacements to expect in the next five years, it is very much easier to make economical arrangements with regard to the existing fleet, and to take risks which otherwise would be justified; whereas, if they were living in a state of uncertainty as to what new ships would be built, and when they could not risk getting rid of ships in being, not knowing what might be coming along in the future. Herein, therefore, are some of the fruits of the Birkenhead program, as it is called, of 1925, for not only do the Admiralty save by scrapping older ships which otherwise would have to be retained, but they are also able to save in dockyard work as well as in personnel.

The Cruiser Submarine X-1

Navy and Military Record, 4 August, 1926.—When is the cruiser-submarine *X-1* to finish trials and join the fleet? Laid down in 1921 and completed in 1924, she has been carrying out extended trials for thirty months. Beyond her displacement, no details of the ship have been published, and of the results of the trials nothing has been made known. No opinion has been expressed officially as to what service *X-1* will perform. She has cost over £1,000,000, and no one seems able to point to a use for her.

The view is held by a considerable and important body of naval opinion that the cruiser-submarine is not a paying proposition. She is too big for easy handling as a submarine, and is too weakly armed and defended to fight as a surface cruiser. Without an obvious tactical rôle in view the ship would seem to have been built as an experiment. But of what end? It will be interesting to know if the Admiralty can justify the expenditure of £1,000,000 on a vessel that at present appears to be a "white elephant."

Raising the "Hindenburg"

London *Times,* 16 August, 1926—The salvage crew employed by Messrs. Cox and Danks on the raising of the German battleship *Hindenburg* at Scapa Flow feel they are within measurable distance of success. Yesterday the fore part of the ship was afloat, though the stern was still resting on the bottom, but before proceeding further with pumping efforts were directed towards stabilizing the vessel so that when pumping began on the after portion the ship would not get beyond control. Last night it was ascertained that the stern had settled down on a rock. Part of it had been smashed by the weight of the structure, but there were indications that both the hull and the false bottom had been pierced. It was not anticipated, however, that this difficulty would prove by

any means insuperable to the divers. Work is proceeding night and day, and the announcement of the successful culmination of months of labor may be expected at any moment.

A gang of some 200 men, including about a score of divers, have been at work on the *Hindenburg* most of the summer. The magnitude of the task may be gauged from the fact that some hundreds of patches have been put on the hull. The actual work of pumping started over a week ago. As the fore part of the ship was emptied of its dead weight of water and gained buoyancy the strain on the hull was indicated by signs of warping. Patches came off and some of the work of months was undone almost in a moment. Mr. Cox, the managing director, who has been in constant attendance during the crucial stages of the operation, took prompt measures to overcome these difficulties, and he and his staff are full of hope that the main difficulties have been met and that their prize will soon be afloat.

Australian Navy As Empire Link

Christian Science Monitor, 1 September, 1926.—Commodore T. E. Wardle upon retiring from the command of the Australian Navy in order to return to England, combatted the idea sometimes expressed that Australia erred when it determined to have a separate navy, instead of depending entirely upon the British Navy for defense.

"I have heard it put forward," he said, "that the Australian Navy is a wedge which might eventually separate Australia from the Empire. I do not believe that is a possibility. A navy that is being trained in the traditions of honor, loyalty, discipline, and service, of the British Navy, as the Australian Navy is, can be no wedge, but must be a strong link in the chain which binds Australia to the Empire."

A Successful Flying Boat Cruiser

Engineer, 6 August, 1926.—The safe arrival of the two supermarine "Southampton" flying boats at Plymouth on Friday last marked the successful completion of the first long-distance cruise which has been made by aircraft belonging to the Royal Air Force. The two boats were under the command of Squadron Leader G. E. Livock, and they made a round trip to Egypt and Cyprus, involving a total flight of approximately 6,065 sea miles. Standard air force machines, with a full service load, were employed, and the flight was undertaken to a set time table as a service exercise. Starting from Cattewater Air Station, Plymouth, on July 1, the boats crossed to Hourtin, Bordeaux, and proceeded by way of the river Garonne to the seaplane station at Berre, near Marseilles. After a day's rest at that port, the boats then flew to Naples, where another day was spent. On July 6 they went on to Malta. From

Malta the journey was continued to Benghazi on the north coast of Africa, and from that point to Aboukir, and further by way of Haifa to Famagusta in Cyprus. The return journey was made via Aboukir, Athens, Corfu, and Malta, after which the same course was resumed as that taken on the outward journey. The machines were equipped with Napier Lion engines, and standard wireless equipment was carried.

FRANCE

French Naval Construction

Engineer, 30 July, 1926.—The deplorable state of French national finances has not prevented the Chamber of Deputies from voting the credits necessary to carry on the program of naval construction during the coming year. It is true that the credit of 11,210,000f. is extremely modest in view of what is required to be done. It is barely sufficient to continue the program which provides for the laying down this year of one cruiser, three destroyers, four torpedo boats, one submersible cruiser, one first class submarine, one mine-laying submarine, one vessel for revictualling and replenishing submarines, two oil tankers and a training ship, the last named to replace the cruiser *Jeanne d'Arc.* The naval commission now proposes to replace the training ship by fighting units which are regarded as more urgent. The sum voted will just keep the men at work in the arsenals. The program is already a little behindhand, and it is hoped next year to accelerate its execution with an expenditure of 154 million francs, to be followed in 1928 and 1929 with annual credits of 310 million francs and a final credit in 1930 of 172 million francs, when the program should be entirely completed. All this will depend, of course, upon the success of the efforts now being made to put the country's finances in order. The navy is probably suffering more severely from the necessity of cutting down expenses than any other state department. There are many complaints in France of the unsatisfactory and arduous conditions under which the naval technical administration has to work, and for a long while past there have been proposals to remove the staff from the rue Royale to offices better adapted to modern requirements. No industrial firm would think of employing highly specialized men under such conditions as obtain at the Ministry of Marine. In private industry it is a matter of policy to offer encouragement to those who can render the best service, and in the marine there was little need, at one time, for such inducement, since the position of naval architect or naval engineer in the rue Royale outweighed all consideration of immediate material advantage. There was always a prospect, after retirement, of finding lucrative employment in private industry. As all the big engineering firms and shipyards work for the state, the services of men experienced in official ways are invaluable.

The last few years have seen many changes in the situation, owing mainly to the practical abandonment of naval construction during the war and immediately afterwards, and to the growth of private shipbuilding enterprise, which has made far greater strides than is justified by shipbuilding activity. At a time when it is found necessary to carry out a policy of severe economy in the naval services the best architects and engineers are attracted by the better opportunities offered them by private firms. It was even feared that the technical administration would suffer severely from the resignation of so many capable men, but the execution of the shipbuilding program shows that there is no falling off from the high quality of the work which has always characterized the rue Royale, and it is certain that the ships recently completed have fully maintained the traditions of French naval architects and engineers. The trials of the *Primauguet,* the first of the light cruisers to be completed, came up fully to expectations, and even exceeded them. Alike as regards speed, fuel consumption, and seaworthiness, the results are declared to have been highly satisfactory. A speed of 32 knots was obtained, and a twenty-four-hour continuous run was maintained at 20 knots. With the light cruisers *Duguay-Trouin* and *Primauguet,* the destroyers *Tiger* and *Chacal,* and torpedo boats like the *Simoune,* the French Navy possesses types of vessels of its own which have been created with only a reflected experience of actual war conditions. The French Navy suffered severely during the war, more from the attacks of underwater craft than from actual fighting, and it is probably that experience which suggested the necessity of sacrificing armor to speed and to facility of maneuvering. The suppression of armor is criticized as offering too much vulnerability, but the new light cruisers are obviously designed for the protection of transports in the Mediterranean, and the maximum armor possible for vessels of this type would scarcely be more effective than no armor at all. The program, so far as it is carried out, aims at protecting the route between France and North Africa, and is regarded as indispensable for preserving communication with the more distant colonies. As a matter of fact, so much attention has been given to welding up the North African territories with the mother country that the interests of the more distant possessions have been neglected, and these may involve strategical necessities which will give new developments to the program as it proceeds.

The naval strategy of the future is so uncertain that the French refuse to endorse any proposal of naval limitation which will deprive them of the right to show a preference for any particular type of craft. At the Geneva Conference there was a complete divergence of views between the Anglo-American and Latin delegates, the former insisting upon each type of craft being limited in the same proportion as battleships at the Washington Conference

and the French securing a majority in favor of a limitation of tonnage which would be distributed over the types of vessels preferred by each country. This is a step in advance, for the French no longer claim the right to build an unlimited number of submarines but accept a total restriction of tonnage which will cover as many submarines as the country cares to construct within those limits. The efforts of Great Britain and the United States to restrain submarine activity have therefore only partially succeeded in these preliminary negotiations, and the French concession appears to have been made in the belief that it would prove entirely unacceptable, in which event France would continue to have a free hand in the building of underwater craft. This is in accordance with the policy of the present Minister of Marine, Monsieur Georges Leygues, who was responsible for the program of naval construction now being carried out, and it is certain that a sufficiently powerful fleet of light cruisers, destroyers, torpedo boats, and submarines will be created before the laying down of any other type of vessel is entertained.

Thirty-Knot Cruisers

Marine Journal, 2 August, 1926.—The 8,000-ton cruisers of the French *Primauguet* type have been criticized extensively but they are well worth the attention of naval architects in their attempt to devise a smaller and more economical type than the 10,000-ton *Washington* class. The 6.1-inch high velocity gun with which the French ships are fitted is a wonderful piece of French workmanship, although it is said that it is too light for the work, and the use of it avoids the very easy fault of over-gunning a ship which is built specially for speed. Also it has to be remembered that at the Battle of the Falklands and elsewhere the German high-velocity 4.1 outranged the British 6-incher and did a good deal of damage. The French *Primauguet* ships were designed with four sets of Parsons-geared turbines developing 100,000 horse power and supplied by eight Guyot boilers, and on trial the same ship steamed at 30 knots for over twenty-six hours without the least difficulty.

New French Destroyers

Engineer, 23 July, 1926.—With the completion of the first group of vessels authorized by the Navy Law of 1922 the French Navy has been strongly reinforced. The new vessels include the six large destroyers—or flotilla leaders, as we should designate them—of the *Jaguar* class, and the twelve smaller boats of the *Simoun* series, the majority of which have been commissioned after successful trials. The former vessels are of special interest, representing as they do the heaviest and most powerful type of torpedo craft to be designed for any navy up to the present date.

The *Tiger* and her five sisters are uniform in every essential particular, the leading details bring as follows:—Length between perpendiculars, 392¾ feet; length over all, 416 feet; breadth, 36 feet; normal draught, 14¾ feet; displacement at normal draught, 2,359 tons; at full speed, 2,870 tons. The *Tiger* is equipped with turbines of the Rateau type, made by the Ateliers et Chantiers de Bretagne, of Nantes. There are five small-tube boilers. The reduction gearing was designed and manufactured by the Power Plant Company, Ltd., of West Drayton, Middlesex. The radius of action at an economical speed of 15 knots is 3,500 knots. The performance of the *Tiger* on trial was considered to be very satisfactory. A maximum speed of 36.7 knots was attained, the vessel continuing to travel at that pace for 1½ hours. During an eight-hour endurance run, in indifferent weather, a mean speed of 35.9 knots was recorded, that being 0.4 knot in excess of the designed maximum speed. The boilers developed considerably more than the 50,000 horse-power specified, and had a full head of steam been admitted to the turbines there is no doubt that a still greater speed would have been reached. In fact, it is unofficially reported that the *Tiger* has made 37 knots since being placed in commission. The *Chacal,* of the same class, has given equally good results. Both vessels were built and engined by private industry. On the other hand, some trouble has been experienced with the dockyard-built *Jaguar,* designed like her sisters for 50,000 shaft horse-power and 35.5 knots. Her average speed during an eight-hour run last month was 34.5 knots, the maximum velocity being 34.8 knots. This is the highest speed of which she has yet proved capable, though the machinery was developing 52,500 shaft horse-power. In this ship part of the condenser tubing had had to be replaced.

Each vessel is armed with five 5.1-inch guns on the center line, two 2.9-inch anti-aircraft guns, and six 21.7-inch torpedo tubes on triple mountings. The 5.1-inch is a new mark in the French service. It appears to be a short weapon, probably not more than 40-caliber at most. The projectile weighs 27 kiols. (59½ pounds), or 33 kilos. with a special cap. The blast screens below the superposed guns at bow and stern seem rather inadequate as a protection for the crews of the deck guns when end-on-firing is in progress. The ships have characteristic funnel tops and are fitted with the light tripod masts which were adopted some years ago for the majority of French destroyers. The new vessels convey an impression of power and efficiency, and should prove exceptionally useful for Mediterranean service. In addition to the six *Jaguars,* three new leaders of heavier tonnage, the *Lion, Bison,* and *Guépard,* are under construction. They will displace 2,500 tons and the stipulated speed is 36 knots. Twelve further vessels of the same class are included in the Navy Law, to be laid down between 1926 and 1929.

The *Simoun* belongs to a series of twelve destroyers laid down in 1923, most of which have now gone into commission. She was built by the Ateliers et Chantiers de St. Nazaire and launched in June, 1924. Her principal dimensions are:—Length between perpendiculars, 326 feet; breadth, 21½ feet; normal draught, 12½ feet; displacement at normal draught, 1,434 tons; at full load, 1,495 tons. She has turbines with reduction gearing and three small-tube boilers, the designed output being 33,000 shaft horsepower for 33 knots. With the maximum supply of 350 tons of oil fuel on board the seaming radius is 3,000 knots at economical speed, viz., 15 knots. The armament consists of four 5.1-inch guns, one 2.9-inch anti-aircraft gun, and six torpedo tubes of 27.7-inch bore. Ten other destroyers of 1,471 to 1,495 tons are now being built. The *Simoun* and her sister boats have turned out to be successful steamers, the designed speed having been exceeded in most units of the class. The lofty freeboard forward makes them excellent sea boats.

The Control of French Aviation

Aviation, 16 August, 1926.—With the accession to power of the Poincairé Ministry and for reasons of economy the Under Secretariat of State for Air, together with all other under secretariats, has been suppressed. Minister Laurent Eynac, the late Under Secretary of State for Air, who held this post from January, 1921 to July, 1926 and outlived ten cabinets, resigned when the Briand Ministry fell, and was not reappointed by the short-lived Herriot Ministry. Minister Laurent Eynac's retirement from the post will be a great loss to French aviation. Owing to his untiring energy, his ready grasp of the situation, his ability to pick capable collaborators, and his great personal charm, he succeeded in securing for France a very powerful position in the aeronautical world. The policy of long service flights either for record breaking or propaganda purposes, and his active encouragement of the French industry, has resulted in France regaining most of the world's records which had been lost to the United States in 1923.

With the suppression of the Under Secretariat for Air, the technical, manufacturing control, navigation, and meteorological services have now been grouped under a Directorate-General of Aeronautics, which is attached to the Ministry of Commerce, after having been temporarily attached to the Ministry of Public Works. Inspector General Fortant, hitherto Director of the Technical Service, has been appointed head of this new directorate, with the title of Civil Director of Aeronautics. Colonel de Guys, who was M. Laurent Eynac's *Chef de Cabinet* has been appointed Director of Military Aeronautics, in place of General Dumesnil, who held this post from 1920.

M. Laurent Eynac will probably re-enter the field of journalism, which he left upon becoming Under Secretary of State for Air, when he also relinquished control of the magazine, *L'Air*, which he founded.

Recent French Long Distance Flights

Aviation, 9 August, 1926.—Two interesting long distance flights have recently been made by French fliers in attempts to establish new world records for distance without refueling and for endurance. On June 26, at 5:50 A. M., Captain Arrachard with his brother, Sergeant-Major Arrachard, set out from Le Bourget Airdrome, Paris for Basra, Mesopotamia. The distance is 2,700 miles and the French fliers successfully covered it in 26½ hours. They flew a Potez biplane with a Renault 550 hp. engine and carried with them 748 gal. of gasoline for a 30-hr. flight. A previous non-stop record flight was made by Captain Arrachard in February, 1925, when, with Captain Lemaire, he flew 1,980 miles from Etampes, France, to Villa Cisneros, on the coast of Rio de Oro, West Africa. However, the flight of Lieutenants Macready and Kelly of the U.S. Army Air Service from New York to San Diego, a distance of 2,650 miles, in 27 hr., is only just beaten by the recent flight of Captain Arrachard.

The second recent long distance flight of French fliers probably breaks the record set up on June 26 by the Arrachard brothers. Captain Girier and Lieutenant Dordilly of the French Air Service. They left Le Bourget Airdrome at 5:20 A. M. on July 14 for Omsk, Siberia, an air line distance of 2,937 miles. After encountering very bad weather on the way the fliers arrived at Omsk at about 1:00 P. M. on July 15. Allowing for the difference in time at the two places, this represents a flying time of about 29 hours. They flew in a Breguet plane with a Hispano-Suiza engine of 500 hp.

Commercial Returns of French Air Lines

Aviation, 9, August, 1926.—An exact picture of the five chief French lines of commercial aviation, of their dependence upon state subsidies and their low commercial return, is presented for the first time in the report made to the French Parliament in connection with the 1926 budget for aeronautics.

In brief, these are the major conclusions drawn from the statistics of the report: The average receipts of the five lines during the first 9 months of 1925 were 10:97 francs per ton-kilometer. The average state subsidy given them was 60.32 francs per ton-kilometer. Thus, the actual commercial receipts were about 18 per cent of the subsidies. The commercial return of the five lines combined, meaning the traffic handled as compared with the maximum carrying space available, was 40 per cent.

In 1924 total subsidies granted by the French Government to the five air navigation companies amounted to 41,422,000 francs. In 1925, they reached 51,610,000 francs. In the 1926 budget passed by the Chamber late in April they were placed at 60,500,000 francs, and accounted for 42 per cent of the entire appropriation for civil aeronautics.

During the first 9 months of 1925, 69 per cent commercial return was the highest figure registered by any French company, this being the Air Union which operates the Paris-London line. From that figure, the percentage graded down to 8 per cent, the lowest on the Alger-Alicante line of the Compagnie Generale d'Enterprises Aeronautique (latècoére lines). Similarly, the financial returns for the Air Union shows that, while its actual receipts were only 11.47 francs per ton-kilometer transported, its subsidy on the same basis was 19.168 francs. Under this manner of accounting, the Aero-Navale Company (Antibes-Ajaccio line) has the lowest record, or 8.86 francs actual receipts per ton-kilometer transported and 119.01 francs of subsidy.

French Navy Notes

Naval and Military Records for August.—The Paris Senate having unanimously voted on August 3, credits for the 1926 program, active preparations are being made for the laying down at Brest early in November next of a 10,000-ton cruiser similar to the *Suffren,* at Cherbourg in October of a 3,500-ton cruiser-submarine, and at Lorient in November of the 6,000-ton minelaying cruiser *Pluton.* Delays will take place in the laying down of other units, though steps are to be taken to ensure quick construction.

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French as well as Italian coasts are alive with naval and aerial activity and offer an unprecedented spectacle of war-like preparation. Spain, so long napping, is joining in the naval game, and is fast becoming a tactical and strategic factor of no mean weight. The defensive alliance she has just contracted with Italy may be the beginning of an all-Latin alliance.

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Battle practice under pretty realistic conditions, is being carried out in the Mediterranean. Nothwithstanding the drawbacks of the short time (eighteen months) recruiting system, guncrews are nearly exclusively made up of long-service petty officers, thoroughly trained on up-to-date lines for long-range firing under all conditions of sea and visibility. Results are remarkable, excelling all pre-war records that were good. Greater attention is paid to gunnery efficiency on board flotilla units and gunboats; tests with new shells (partly designed against submarines and partly against avions) are frequent and realistic. As financial conditions preclude the possibility of battleship construction, discouraged besides

by the anti-French Washington Agreement, efficiency in cruiser, torpedo, and aerial warfare will become more and more the main *raison d'être* of the French Navy. In this respect a new Marine Française is in the making, the strategic and tactical tendencies of which are not unlike those of the new German Navy.

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The projected command by Spain of three 10,000-ton cruisers, three flotilla leaders, and twelve destroyers, without mentioning submarines, will have the effect, when realized, of increasing two-fold the actual sea power of the peninsula, and, of course, or reducing still further the share of Mediterranean power belonging to France. Spain has in service, in the *Reina V. Eugenia,* of 5,600 tons and 26 knots (1920), and in the *Don Blas de Lego* and *Mendez-Nunez* (1922-23), of 4,750 tons and 29 knots, cruisers superior to the ex-German *Kleine Kreuzer* incorporated in the French fleet, while the completing *Principe Alfonso* and *Almirante Cevera* (1925), of 8,000 tons and 35 knots (?), are fully a match individually for the *Duguay-Trouin.* This means that Spain stands up to France in the matter of quality, which never happened in the past. The strategic weight in the balance of the Balearic Islands has good historical foundation. Had Spain made such an effort, thorough and comprehensive, thirty years sooner she might have preserved her colonies. Today through the prosperity and wealth partly acquired as a consequence of the World War, she becomes anew a factor in European politics. This *fait nouveau* France cannot afford to ignore.

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Some concern is being caused by the quick remaking of the German Navy. Obviously Berlin experts being on the right side of their comprehensive painstaking program of practical experiments, have started in earnest to apply the invaluable data they are known to have collected. Their industrial plant and method are second to none. Four cruisers are either ready or in hand, the two latest, of fully 6,000 tons normally (8,000 tons at full load) being of new faster type, superior to the *Duguay-Trouin.* . In 1928-29 Germany will have in the North six fine 30-knot (and above) cruisers, superiorly manned and officered, that will, in the light of war teachings, considerably depreciate the margin of usefulness of the three 18,000-ton *Voltaires.* But for the British Armada, the German Navy would anew predominate in the North.

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The French share of sea power is shrinking further as the two-fold consequence of German naval renovation and of the growing offensive and defensive armaments of Italy. Since the war the Brest division du Nord, now under Rear Admiral Chauvin, has been reduced to the three obsolete pre-Dreadnoughts, *Voltarie,*

Diderot, and *Condorect* (1909), designed as improved copies of the British *Agamemnon,* that have cost within the past few years in patching up, reboilering, and all-round modernizing infinitely more than they are worth (at the very moment when the powerful quadruple-turret *Normandies* were cleverly discarded as not being quite up to date and much *surannés*). It had been thought in high quarters, not without good reasons, that the three *Voltaires,* mounting together twelve guns of 12-inch bore (440 kilo shells of tried efficiency) and thirty-six weapons of 9.4-inch, with efficient 220 kilo shells, would be a match on the high sea for the six German *Elsasses.* The six 13,200-ton German battleships are older than the *Voltaires,* and on paper very inferior both as means of offense *Voltaires* against aerial offense by reason of their upper armor and defense, mounting each four 11-inch and fourteen 6.7-inch of old type, and therefore in appearance completely outranged by the heavier French calibers. Moreover, whereas the *Voltaires* have a wide end-to-end belt, the *Elsasses* are practically soft-ended, and would have every chance to lose in the "give-and-take-game" on pre-war lines.

The situation has changed, however, to the advantage of the Germans. In the first place the methodical and persevering Boches have been at pains, after lengthy laboratory studies, researches, and experiments, to modernize and modify at great cost the six obsolete *Panzerschiffe,* which the Allies in their goodness (some say blindness) had left them *à titre de consolation.* German will and genius, combined with superior financial and industrial resources, has rendered those so-called "harmless toys to play with" efficient fighting machines under new conditions. The quality of German ordnance that proved good under war test is believed to have considerably improved. Defense on new lines has been provided against submarine explosions, shells, and bombs, as well as against gas attacks. Even before the modifications from which they have benefited the *Elsasses* were better protected than the deck.

Nominally the French have the advantage of range, that depends on caliber, visibility, and speed. Old German battleships are modestly credited with 16 knots in an official *Taschenbüch.* In practice they are probably faster than the heavier and overloaded *Voltaires,* though the latter have their boilers and engines periodically revised and kept in efficient condition. But the disquieting *fait nouveau* is that artificial clouds, by reducing visibility conditions, have for effect to confer position of tactical vantage to the side more efficient in chemical warfare. That side is Germany; that is the home of chemical science and chemical industry, and spends more in that line than all other powers combined. Chemical intervention means a revolution in tactics. French experiments under Admirals Dumesuil and Violette have shown that much.

The obsolete but keenly-led Boche fleet has, of course, gone much further in that demonstration. But it is highly satisfactory to know from German gazettes that only harmless humane clouds and gases are henceforth to be used. To temporarily blind and disarm the enemy, not to slay him, is the game. The tactical result would be the same.

French sea power in the North must not be judged, however, by the worth of the three old *Voltaires*. The cuirasses, meant for coast defense, would not fight alone, but are the nucleus of an important and strenuously trained torpedo force, and would besides have the cooperation of shore batteries and aerial stations. Such combined comprehensive tactics have just been applied with "maestria" by Admiral Chauvin in mimic attack and defense of Cherbourg and Havre. But when everything is said the 6,000-ton and 30-knot *Emdens* and the 800-ton and 35-knot *grosse torpedobooten*, just now growing fast at Wilhelmshafen and elsewhere, will form a mobile force with redoubtable possibilities against the extensive and vulnerable Atlantic shores of France. Under such conditions defense is costly and ineffective; offense is favored. Chemical warfare facilitating camouflage and feints, and the quick safe escape of a weaker force, having effected a bombardment. Officially the Fatherland has no naval aviation; Versailles "scraps of paper" say so. In wartime there would be swarming up those Yunkers, Dorniers, Fokkers, now so patiently being prepared and perfected for commercial use. That also has to be guarded against.

France is thus in a much worse position on the water than she was in 1914, when the Entente Cordiale with Great Britain and the Russian Alliance ensured a measure of safety to her Northern shores. A virtual alliance unites Botheland and Sovietland; the Bolshevist fleet, rapidly reorganized under able and energetic control, had to be reckoned in, and can no longer be dismissed lightly as *quantité négligeable*, rendering very precarious France's naval situation. Hence the demand for reinforcements to be sent from Toulon to the channel and especially for the permanent quartering in Brest of the three new cruisers of 8,000 tons, that would constitute with three 2,400-ton *Chacal* and six 1,500-ton *Simoun's* a "division volante" of 30-knot sea speed, of remarkable mobility and power, available also for colonial defense.

Unfortunately the rise of the Italian Navy is not without imperilling France's vital interests in the Middle Sea. The peninsula, overflowing with surplus population, is resolutely out for territorial and commercial expansion by peaceful means if possible, but fully prepared also for stronger arguments. Italian statesmen have not minced words, their verbal fearlessness contrasting with Parisian bleatings. Efficiently, all-round efficiency in the government, navy, and army, together with hard, earnest work for ex-

pansion at all cost in the economical, as well as in the political field, such is the forceful and mighty policy of new Italy. The fleet has quality and number; the forty-seven units that formed the naval pageant at Ostia before the King and Signor Mussolini make up an *ensemble superior* to the partly obsolete forces now exercising off Toulon under the command of Admiral Violette. No mere appearance either. Rigid discipline now prevails in the Italian personnel, that has been within the last few years carefully and mercilessly weeded out of all anti-patriotic and unreliable elements, whereas it is no secret too many communists disgrace the glorious French naval uniform. The Toulon *escadre de combat* is a costal force; its daily routine and periodical exercises spell defensive. More ambitious and logical also is the Rome Admiralty; Mediterranean strategy on a large scale, the command of the central passages with the help of newly-created or reorganized *points d'appui* in Sicily and Sardinia, and of cleverly-distributed aerial stations; such are the objects of its attention, as can be judged from the composition of the Italian fleet in commission and of recent maneuvers on *grand guerre* scale. Even taking into consideration the superior of the French battleships of the *Bretagne* class (13.4-inch armament) and the excellent gunnery of the fine cuirassés under Admiral Violette, the Marine Française is far from possessing the safe passage facilities and the *maitrise de la Mediterrané occidentale,* that avowedly and logically constitues the minimum strategic program of France on the water.

JAPAN

Naval Shipbuilding in Japan

Engineer, 23 July, 1926.—For the next financial year the Japanese Ministry of Marine has drafted naval estimates amounting to £32,000,000, which is £8,000,000 more than those for the current year. This large increase is mainly due to the shipbuilding program for which parliamentary sanction is about to be invited. That program embraces four 10,000-ton cruisers, a group of 1,700-ton destroyers, and five submarine cruisers of 2,000 tons. These vessels are, of course, additional to the new construction credited to Japan in the official Return of Fleets. The cruisers *Kako* and *Furutaka,* laid down in 1922, have just been commissioned. They are sister ships of 7,100 tons and 33 knots, their peculiar feature being the mounting of the main armament of six 8-inch guns in separate gun-houses, three forward and three aft. The *Aoba* and *Kinugasa,* begun in 1924, have the same displacement, speed, and armament as the *Kako,* but in their case the six 8-inch guns are paired in turrets, two at the bow and one astern. The four cruisers of the *Nachi* class, laid down in 1924-25, have a standard displacement of 10,000 tons and are to carry eight 8-inch guns. Their speed has not yet been disclosed. According to the return, twelve

first-class destroyers are under construction, the first five being boats of 1,400 tons, the others of 1,800 tons. Twelve more destroyers are listed as "projected," but it is not quite clear whether they have actually been authorized. Twenty-six submarines of various classes are in hand. Of the first thirteen, the smallest displaces 770 tons and the largest 1,970 tons. No details of the other submarines are given.

Replacement Program

From the Japanese Press.—While the question of the replacement program involving an expenditure of 299,000,000 yen is still troubling the navy department, the second replacement program which must be started by 1930-31 is another question which is confronting the navy department.

There are some officials in the department who argue the advisability of starting the second replacement program of auxiliary ships before the construction of capital ships which starts in 1931-32; however, if the second auxiliary replacement program is not started prior to 1931-32, it will mean that during the year 1931-32 no ship will be completed. The navy will, however, try to have the second auxiliary replacement start in 1930-31, though this may be a serious drawback in obtaining the authorization of the 299,000,000 yen program.

Under the present program three years is the time allowed for the construction of a destroyer, but in the future this will be reduced to two years, therefore those destroyers that are to be completed in 1931-32 work will have to be started in 1930-31. If the second auxiliary replacement program starts in 1930-31 the construction of several destroyers scheduled under this program will be started in 1930-31, and the first apportionment under this program will be 20,000,000 yen. This will greatly increase the appropriation for 1930-31, and the fate of the 299,000,000 yen will be in danger. The navy has insisted that the 299,000,000 yen program must be completed by 1930-31, but it is likely that they will yield to postponing this program one year until 1931-32, as a sacrifice for the approval of the second auxiliary ship program which starts in 1930-31.

The ships that will have to be replaced in 1931-32 and 1932-33 are as follows:

In 1931-32—First-class destroyer *Tanikaze;* second-class destroyers *Momi, Nashi, Take;* submarines *Ro—1, 2, 13, 14, 24, 51.*

In 1932-33—First-class destroyers *Minekaze, Sawakaze, Okikaze, Shimakaze, Yakaze, Kaki, Toga, Kiku, Hishi;* submarines *Ro—15, 19, 20, 25, 52, 53, 54.*

It therefore follows that in 1930-31 an appropriation of over 20,000,000 yen will be required to start the construction of at least

four destroyers and six submarines as a part of the second auxiliary ship program.

The navy department is anxious to have the 200,000,000 yen replacement program approved next year, but there is danger that the finance department may propose a decrease in the number of ships to be built under the program or to extend the completion of the program by one year. However, the navy department is opposed to this, as it will greatly increase the appropriation for the fiscal year 1931-32 and will overlap with the construction of capital ships and the second auxiliary replacement program which start about the same time.

The yearly proportionments from 1926-27 to 1930-31, including the old program, destroyer program, and the program to be started next year, are as follows:

Year	Old	Destroyer program	1927–1931 replacement program	Total
	Yen	*Yen*	*Yen*	*Yen*
1926–27	80,000,000	8,000,000	.....	88,000,000
1927–28	75,000,000	10,270,000	30,000,000	115,270,000
1928–29	68,000,000	7,830,000	39,000,000	115,030,000
1929–30	.....	.....	115,000,000	115,000,000
1930–31	.....	.....	115,000,000	115,000,000

Auxiliary Vessels

Japanese Advertiser, 26 July, 1926.—Admiral Takeshi Takarabe, Minister of the Navy, has decided to carry through the auxiliary warship construction program at the expense of the proposed naval air force. Frequent conferences of the Navy Ministry have been held regrading the budget for the next fiscal year. Particular attention has been paid, during the last three weeks, to the auxiliary fleet program.

It is stated in reliable quarters that Admiral Takarabe has consented to the postponement of several new enterprises, for the sake of its realization. Instead of increasing the naval air force to two corps and a half, it will be left at one corps and a half, accounting for a saving of 1,800,000 yen.

To Cover Four Years

The construction program at present covers four years, in spite of many suggestions favoring five years. A definite figure for the entire naval budget is to be submitted to the Finance Ministry at the end of July.

The naval authorities have confessed themselves to be rather annoyed at the retrenchment policies of the Wakatsuki Cabinet, which resulted in the postponement of their program at the last session of the Diet, and are prepared to fight to the last ditch in the coming session.

The Ministry of War held its first conference on the budget Saturday and General Ugaki the Minister, submitted an estimate of 18,400,000 yen to cover new enterprises.

Aviation

Engineer, 20 August.—A movement is on foot in Japan for the rapid development of the country's commercial and military aerial forces. While the extent to which the army is to develop its air arm has not been disclosed, it is reported that a company is being formed to operate a commerical fleet which, in conjunction with the military air force, will ensure Japan's aerial supremacy in Asia. The proposed commercial company is, it is stated, to receive a subsidy of about £1,000,000 from the Japanese Government, and has for its object the building of a commercial fleet equalling in strength that of France, England or America. If the company chooses to follow the example of this country, its project need not be regarded as over-ambitious. The Imperial Airways organization, which is also in receipt of a government subsidy of a million pounds, has in use no more than fourteen machines, with a total seating capacity of but 178. It is held in Japan that a rapid development of the country's aerial forces is greatly preferable to increasing the number of battleships and merchant vessels. In conjunction with the army and navy, such air forces would, it is argued, ensure Japan's commercial position in Asia.

Promotion and Retirement of Naval Officers

Japanese Press—Promotion is by selection for all grades except from midshipman to sub lieutenant, second class. The selections are both "up" and "out." Relatively few selections "out" are made below the grade of lieutenant but above this grade the forced retirement provision is applied with increasing ruthlessness, reaching a maximum in the flag ranks. Selection "up" (rearrangement of precedence list) is seldom resorted to in promotion to captain and above, but it is drastically applied below the grade of captain and reaches a maximum in the lowest grades.

The selection board consists of about twenty flag officers, composed of the Minister of the Navy (senior member), vice minister, chief of the general staff, vice chief of staff, chiefs of all bureaus, commandants of all naval districts and naval stations, and commanders in chief afloat. The board meets once a year on or not later than November 4. Promotions are as of December 1.

The minimum service required in grades to be eligible for promotion, the average services and ages in grades, and the ages of forced retirements are shown in the table below.

Rank	Minimum service required[1]	Average service performed	Average age in grade	Forced retirement age	
				Line engineer, hydrographic[2]	Staff corps
Sub lieutenant, second class	1	2	22	—	—
Sub lieutenant, first class	1	2–4	24	38	40
Lieutenant	4	5–8	27	43	44
Lieutenant commander	2	5–7	33	45	47
Commander	2	4–5	37	48	50
Captain	2	5	41	52	54
Rear admiral	3	4	46	56	58
Vice admiral	None	6–7	50	60	62
Admiral	None	—	56	65	—

[1]One-third additional constructive service is given for all sea duty and air service.
[2]Promotions are invariably based on the average service in grade (column 3), therefore age in grade retirements have never been effective except for admirals.

No officer can be forced to retire for other than physical or disciplinary reasons who has had less than eleven years' commissioned service, but voluntary retirement with less than eleven years' service is sometimes permitted. The Minister of the Navy is empowered to demand the retirement of any officer (except those with less than eleven years' service) at any time. In actual practice the selection board is delegated this authority and advises the minster which officers shall be retired. Two methods of retirement are used, namely: (a) retirement in grade, and (b) immediate retirement after promotion to next higher grade. The ratios of using these two methods of retirement in the various grades are about as follows:

Lieutenant	6 (a) to 1 (b)
Lieutenant commander	2 (a) to 1 (b)
Commander	1 (a) to 2½ (b)
Captain	5 (a) to 1 (b)
Rear admiral	3½ (a) to 1 (b)
Vice admiral	Practically all retired under (a).

When officers, due to ill health or some other cause not reflecting upon their professional ability, can not perform active duty, they are placed on the "waiting list" for one year with eighty per cent pay. At the end of that year if still unfit for active duty they are placed on the "unemployed list" for one more year with sixty per cent pay. At the expiration of this second year, if not ordered to active duty, retirement is mandatory.

For disciplinary reasons officers are sometimes placed on the "suspended list" with thirty per cent pay.

Officers on the "waiting list" are eligible for promotion, but those on the "unemployed" and "suspended" lists can not be promoted.

Officers when retired are placed in the reserve, where they remain for a varying number of years, dependent upon age and rank at time of retirement.

The fundamental principle upon which promotion is based is that officers shall serve in each grade the number of years specified in column 3 of preceding table. The percentages of officers in each grade are not fixed by law, but such percentages have been approximately determined and are fairly closely adhered to. To carry out this system of promotion, officers are, generally speaking, considered available for selection by groups. The chief of the personnel bureau is required to supply the selection board with all necessary data pertaining to the total number of officers in each grade that should be considered for promotion, the numbers to be promoted, retired, etc.

In actual practice promotions operate as follows:

(a) From midshipman to sub lieutenant, second class (ensign) it is by seniority. The special post graduate courses in gunnery, torpedoes, submarines, etc., have not been completed by this time.

(b) From sub lieutenant, second class (ensign) to sub lieutenant, first class (lieutenant) selection "up," i.e., rearrangement of precedence list, is extremely drastic. There are few retirements because the eleven years of compulsory service have not been completed. Occasionally, however, officers are passed over and held in this grade until they can be forced to retire.

(c) From sub lieutenant, first class (lieutenant) to lieutenant both selections "up" and "out" are made. The rearrangement of precedence list is again drastic but the retirements are few. In December, 1925, 187 were considered for promotion, 165 were promoted, twenty were passed over, and two were retired in grade. Some of those passed over will be retired before the next selection board meets, others will probably be given one more chance.

(d) From lieutenant to lieutenant commander same as (c) except more moderation exercised in rearranging precedence list and greater number of forced retirements. In December, 1925, 198 were considered for promotion, 119 were promoted, eight of whom were immediately retired as lieutenant commanders, and eighty-nine were passed over. The average annual attrition in this grade is about 4⅓ per cent.

(e) From lieutenant commander to commander about the same as (d). In December, 1925, 140 were considered for promotion, ninety-seven were promoted, twelve of whom were immediately retired as commanders, and forty-three were passed over. The average annual attrition in this grade is about 3⅔ per cent. This is exclusive of those retired immediately after being promoted lieutenant commanders.

(f) From commander to captain there is very little rearrangement of precedence, except that those officers who are to be retired immediately after promotion are placed at the bottom of the list promoted. In December, 1925, ninety-three were considered for promotion, sixty eight were promoted, seventeen of

whom were immediately retired as captains, and twenty five were passed over. The average annual attrition in this grade, exclusive of those retired immediately after promotion to it, is about two per cent.

(g) From captain to rear admiral, from rear admiral to vice admiral, and from vice admiral to admiral there is no rearrangement of precedence in promotions. In December, 1925, there were twenty-one captains remaining on the active list who attained that rank in December, 1920. In accordance with established policy all were promoted en bloc to rear admirals. Of this number, six were retired immediately after promotion. At the same time nineteen additional captains, who were not due for promotion, were retired in grade. At this selection (December, 1925) eight rear admirals (all having obtained that rank in December were due for promotion and were promoted en bloc to vice admirals, two of whom were retired immediately after promotion. At the same time twenty-three rear admirals, not due for promotion, were retired in grade. No vice admirals were promoted to admiral but eleven were retired in grade. One admiral was also retired in grade. The average annual attritions in the above grades, exclusive of the forced retirements immediately after promotion, are as follows: Captains twelve per cent, rear admirals twelve per cent, vice admirals thirteen per cent.

By this means of extremely drastic selection, the navy is able to keep officers of all ranks on their toes at all times, and one must prove himself well above the average to reach the higher ranks. The system is so generally popular that it undoubtedly is operated with the maximum of fairness.

ITALY

The Tangier Problem

London *Times*, 8 August.—The full text of the Pact of Madrid —the treaty of friendship and arbitration between Spain and Italy, recently signed in Madrid—is published today in the Italian press. The pact is for ten years, and at the expiration of that time it will be automatically renewed for further periods of five years, unless it has been formally denounced six months before the period for its expiration. The pact provides, in certain eventualities, for the reference of disputes between the two powers first to a Conciliation Commission and then, if need be, to The Hague Court, Article 13 enacts that if one of the contracting parties, despite its pacific attitude, should be attacked by a third power the other contracting party will observe neutrality during the whole duration of the conflict.

The publication of the text of the pact is accompanied by interesting comment on the part of Fascist journals.

The *Tribuna* says that in a general way the treaty shows that "the League of Nations is not indispensable for those countries which wish to pursue a peaceful policy. On the contrary, it demonstrates that after the past complicated experiences and the disputes which have arisen with regard to the constitution and procedure of the League, if two states have a real desire to strengthen their own friendly relations they must do so directly and by separate treaties, as the League does not offer serious guarantees." Moreover (adds the *Tribuna*), this treaty is a sign that Spain intends to develop an autonomous policy, which, far from being in opposition to the interest of Italy, is parallel to that of Italy, both in the Mediterranean and in Latin-America. This policy may not please those countries which are anxious that their hegemony should remain undisturbed, but it is a fact that this policy exists and cannot be suppressed."

The *Messaggero* suggests that the publication of the pact will convince everybody of the pacific intentions of Italy, and that the whole of Europe will welcome the treaty with satisfaction and without reserve. The objects of the pact, it says, are clearly set in its clauses; it will render the relations between Spain and Italy more intimate, and it will enable them "to consider in a friendly spirit their reciprocal interests." It adds that in negotiating this pact Spain and Italy had "no particular problem in view." The treaty therefore has no connection with either Spain's demand for a permanent seat on the League Council or with the settlement of the problem of Tangier.

As regards Tangier, the *Messaggero* regards it as essentially an international problem, which cannot be discussed by two Powers only, especially at a moment when the revision of the Tangier Statute is about to take place.

Tangier

It is surprising, to say the least, that the Marquis de Estella's statement about Tangier should, with a single exception, have passed off without comment on the part of the Fascist newspapers, which have been in the past so sensitive on the Tangier question. If the Marquis's aspirations were to be realized, not only would Italy be excluded from participation in the administration of the Tangier zone—which officially is still her aim—but the Tangier zone would lose its international character. Apart from the *Messaggero* the *Lavoro d'Italia* is the only Rome newspaper which examines the Tangier question.

This journal returns to its former thesis that the surrender of Abd-el-Krim, far from settling the Moroccan question, has merely raised it to one of international importance. The coast of Morocco, the *Lavoro* maintains, is so important that its fate must be decided by the Mediterranean powers. No suitable solution of the problem can be reached, it says, until the right of Italy to

participate on equal conditions with other powers in the maintenance of an equilibrium in that sector is recognized and until the Tangier zone ceases to be the center of supply for Arab rebels against Spain. The internationalization of the Tangier zone, it adds, is a generally accepted principle, and if Spain insists on her claim, she will meet with stubborn resistance from Great Britain. It would be a danger for Spain if an Anglo-French *rapprochement* were to take place on the Moroccan problem, while an understanding with France, reached on the basis of leaving Spain a free hand in Tangier in exchange for Spanish renunciation of the Rif territory in France's favor, would lead "to the most grave complications." Italy's active participation in the administration of Tangier, adds the *Lavoro,* would dispose of the danger for Spain, and would ensure her sufficient guarantee for her safety: The possession by Spain of the Riff territory is "of capital importance" for Italy, and Italian diplomats will use all their influence to prevent the working of any intrigues to alter the situation. It will be a grave error, concludes the *Lavoro,* if the London and Paris governments show an exaggerated alarm over the Marquis de Estella's declaration, which should be regarded as "a sign of an impossible situation."

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The *Journal des Débats* publishes the following comment on the Spanish claim to Tangier put forward by the Marquis de Estella:—

"How must we explain to ourselves the initiative taken by the Marquis de Estella? The first idea that comes to the mind is that during the *pourparlers* which led to the conclusion of the Italo-Spanish Pact of Non-Aggression—of which the text itself appears harmless—the Italian Government may have promised the Spanish Dictator its support in the Tangier affair in exchange for his help elsewhere. On this hypothesis it would be necessary to suppose that Italy would see in the attribution of Tangier to Spain the means of raising other Mediterranean questions in accordance with the theory, so often maintained in Italy, that every modification in law, or in fact, in Morocco would justify Italy in claiming compensations, a theory which is quite inadmissible from the French point of view.

We do not, *a priori,* set aside this interpretation, but it may very well be wrong. As to the attitude which the French Government should adopt towards the Spanish claim, it is advisable to take time for reflection, and, above all, to take no decision before knowing the real meaning of the maneuver, which may be exclusively Spanish or may have a wider range. Do not let us forget that at the moment the interest of France, which is, moreover, bound up with the interest of peace, is not thoughtlessly to favor changes which might perhaps bring other changes

in their train. We must think twice before allowing existing treaties to be touched."

Sea Power in the Mediterranean

Naval and Military Record, 4 August.—. . . . The Italian naval chiefs are as much afraid of the superior battleship strength of France as the French are of the Italian torpedo flotillas; so that for all practical purposes, each of the two great Latin navies seems on the *qui vive* to checkmate any move that the other may initiate in an effort to gain a marked superiority in naval force in the Middle Sea.

SPAIN: A NEW FACTOR

At the present moment Italy may be said to have the upper hand, not on account of actual superiority in material, but by reason of the close friendship which has sprung up between her and the other dictator-government state—Spain. Until recently it was the fashion—and a fashion justified by the facts—to leave the Spanish Navy out of all considerations of the balance of power in the Mediterranean. This position is quite indefensible today for the Spanish Navy, working in conjunction with British designers and builders, has made of itself an efficient, up-to-date, and powerful force which might well turn the scale in any comparison of the fighting strengths of the sea forces of the Latin powers.

The formation of an all-Latin alliance would be all to the interest of France if the Hispano-Italian naval friendship should develop further. France's position as a sea-power in the Mediterranean is already in jeopardy. The formation of a powerful combination against her would leave her out of the race of power altogether. If such an alliance as has been proposed should ever be formed, it would remove from the minds of the rue Royale naval chiefs the menace of a hostile Spanish-Italian combination, and would, moreover, remove a menace to the French African colonies, which has been feared by many French soldiers and politicians since the imperialistic declarations of Signor Mussolini a few months ago. Whatever the present relations of France and Italy may be, there is no getting away from the fact that the Fascists in their effort to make Italy as much of a "Roman Empire" as possible, are looking for fresh worlds to conquer and are making no secret of the fact. Furthermore, Italy is a prosperous country with a growing population. It will be somewhat surprising, then, if Italy joins willingly in a Latin alliance unless she sees very substantial benefits to herself in the arrangement as well as to her Gallic neighbor.

ITALY AND SPAIN COMPARED WITH FRANCE.

If the defensive alliance suggested should not come to pass, France will probably find it necessary to float a naval program

sufficiently comprehensive to counter the activities of both Italy and Spain, supposing that Spain still inclines towards an Italian alliance. The execution of such a program, in the present state of France's finances, would probably prove a tremendous burden on the French taxpayer, for it is not to be expected that Italy would allow France to gain a superior position without laying herself out to defeat the aims of her rival. Also, it must be remembered that whereas Italy is so situated that she can concentrate all her naval forces in the Mediterranean, France has to maintain a considerable force for the defense of her northern coasts. The French public will always insist on this northern squadron—the fear of a revived Germany is ever present.

Such an alliance as might be arranged between Spain and Italy would very materially affect the position of France as a Mediterranean power. When due allowance has been made for the proportion of French ships which are not available in the Mediterranean, it is quite obvious that not only would France have no margin of superiority over the fleets of Spain and Italy, but she would acually be inferior to them in the classes which are of most account in confined waters.

Spain Holds the Balance of Power

It is probable that within the next few months we shall see some important developments in the naval situation in the Mediterranean, and, indeed, in the general relations between the three principal Latin powers. It is the attitude of Spain that will determine the relative positions of France and Italy as powers of consequence in the Middle Sea. In view of the imperialistic policy of Fascist Italy, I do not think the suggested Latin alliance will materialize, unless, of course, some important inducement can be found to bring Italy into such a league.

Perhaps the most interesting feature of all in the present aspect of the naval situation in the Mediterranean is that the keys of the situation are held by an outside power—Great Britain. Holding Gibraltar and Malta—key-positions on the main trade route through the Mediterranean—and maintaining in these waters a fleet greatly superior to those of the powers whose territories border on them, Great Britain more than ever before holds the balance of power.

SPAIN

Spain to Increase Navy

Marine Journal, 7 August.—Meanwhile Spain is doing very well at the present moment in spite of the slump and their increased prosperity is prompting them to effect some necessary developments in their navy. Their recent experience in the Riff War showed them that their navy is inadequate even for moderate calls upon its services and, immediately following a recent suggestion to build an 8,000-ton cruiser and three big destroyers, three

10,000-ton cruisers have been authorized, in addition to twelve submarines.

When they get under way with this program Britain is bound to come in for a share of the contracts for materials and small parts, although the present coal strike might influence these orders to a large extent. Naturally British interests concerned are following the developments very keenly for Spain has always looked to this country on naval matters, while the agreement that was made some years before the war and which put the dockyard at Ferrol under the joint control of Vickers, John Brown, and Armstrong Whitworth & Company has made the connection very much closer. It is very probable also that a number of British workmen will be needed in a supervisory capacity, while by the time the program is finished Spain will have quite a respectable modern fleet at sea.

Spain's New Navy

Naval and Military Record, August.—While Great Britain has contributed very few warships to the navies of the lesser powers since the Great War, examples of the skill of her designers and shipbuilders are to be found in almost every navy in the world. Nowhere is this more apparent than in the navy of Spain, which depends for its naval shipbuilding upon a private firm, which really represents three great British shipbuilding and armament firms. Since the war this firm has built in the Spanish naval dockyards a series of cruisers, destroyers, and submarines which are fine examples of the trend of modern British warship design. The *Almirante Cervera* design of cruisers is a type very similar to the British *Emeralds,* and the ships are typically British in appearance and general characteristics. These ships were designed by the late Sir Philip Watts. At the same time there were ordered three flotilla leaders, which are almost identical with the British *Admiralty* leaders. On her trials the name-ship of the class, the *Churruca,* attained a maximum speed of 39.76 knots and a mean of 37.64 knots on a trial of four hours' duration. It is a tribute to British preeminence in naval design that these leaders, which are practically a replica of British boats designed nine years ago, are regarded abroad as the finest type of flotilla leader now under construction.

That the Spanish Government is well satisfied with British cruiser and destroyer designs is shown by the fact that under the new naval program another cruiser of an improved *Almirante Cervera* type and three more flotilla leaders of the *Churruca* class are to be laid down in Spanish dockyards. The modern Spanish Navy is efficient in its personnel as well as in its ships, and forms one of the best balanced and organized of the lesser fleets of Europe. That it continues to rely on British designs and supervision in its ships is a fact of what we Britons may well be proud.

Naval Resources

London *Times,* 10 August, 1926—The new Spanish navy estimates are remarkable for the attention given to auxiliary vessels and to resources and equipment at the dockyards. Cruisers are conspicuous by their absence, but this is not surprising, as there were four useful vessels of this category in the 1915 program, of which two have been completed and two are building. It is stated in cabled reports that provision is made for twelve additional submarines, but whether this is part of the fourteen remaining to be laid down under the 1915 building law is not clear. There will also be two oil tankers, three patrol vessels, and minelayers and sweepers, while a naval flying school is to be established in Barcelona. A new 30,000-ton dock has been begun at Cadiz, and a 60,000-ton floating dock is being provided at Cartagena, while floating docks are to be placed at the new naval bases at Mahon and Vigo.

Naval Aeronautics

London *Times,* 10 August, 1926.—The Admiralty has created a solid base for the future development of naval aeronautics at Barcelona, where the naval school possesses landing grounds and a carrier-ship which has seen service in Morocco. The school turns out pilots both of airplanes and small airships. Naval opinion, however, does not consider that one air branch can efficiently meet the requirements of both land and naval warfare. It seems certain, therefore, that future naval programs will provide for independent air forces, which will not need carrier-ships, but can have bases on the coasts of Spain.

Annual Expenditure

London *Times,* 10 August, 1926.—The incorporation of numerous civilian services in the Admiralty and the expense of patrolling the Moroccan coast contribute to give an erroneous idea of the sums which Spain appears to spend on her navy. At present 28,000,000 pesetas go to building new ships, and less than 6,000,000 to the naval bases; that is to say, for the creation of her fleet and naval bases less than £1,000,000 per annum is spent.

National industry has of recent years made some progress towards independence of foreign industry for supplies of war material. The production of the steel foundries at Reinosa increases yearly, the steel being rolled or sent to the forges, which turn out material for the hulls of ships and for artillery. Reinosa and the Carraca (Cadiz) workshops continue to manufacture the latest type of guns up to 6 inch. The new cruisers are entirely armed in Spain.

Flotilla Leaders

London *Times.*—When referring to the decision of the Russian Admiralty to order a number of flotilla leaders from Italian yards,

we gave some comparative figures relating to their design and that of the French constructors, taking for the purpose the Italian *Leone* and the French *Chacal* types. The latter class has a normal displacement of about 2,360 tons, and is fitted with five guns of 5.1-inch caliber in single mountings, two 3-inch anti-aircraft guns, and six torpedo tubes. The speed is 35.5 knots, and the vessels of this class have an oil-fuel capacity of 540 tons. The Italian flotilla leaders of the *Leone* type have a displacement of 2,200 tons, and mount eight 4.7-inch guns in pairs in shields, two 14-pounder, high-angle guns, and six torpedo tubes. Their speed is 35 knots, and they carry 400 tons of oil fuel. A comparison of these designs is now possible with the *Churruca,* the first of the Spanish flotilla leaders, which has just completed her trials, giving a mean speed of 37½ knots. There were indications that even this speed could be increased upon occasion, for some of the official runs on the measured mile at Cartagena were made at over 39 knots. These Spanish flotilla leaders are being constructed at Cartagena by La Sociedad Espanola de Construccion Naval, in which firm British experience is available and British practice is used.

The *Churruca* and her sister ships are twin-screw vessels of 320 feet length, with a beam of 31 feet 9½ inches, and draught of 10 feet 6 inches. The normal displacement is 1,650 tons, and the machinery develops 42,000-shaft horsepower. They are armed with five 4.7-inch guns, one 3-inch anti-aircraft gun, two sets of triple 21-inch torpedo tubes, and two depth-charge throwers. Their sea-keeping qualities are greatly improved by their high and long forecastles, which give better accommodation for the personnel than would be possible if a low bow were adopted. In Britain informed opinion seems to be convinced that the 4.7-inch gun meets all the requirements of the duties to be performed by this class of vessel. Five guns of this caliber, single-mounted, compare very favorably with the five 5.1-inch guns on the French vessels, and it is possible that, in service, the rate of firing of the *Chacal* will not prove to be so satisfactory as that of the *Churruca.* Again, it is doubtful, owing to ammunition supply, whether any real advantage would be gained by twin mounting the guns, as is done in the Italian-built *Leone.*

On the official trials at Cartagena on April 14, 1926, the speeds obtained were: Maximum, 39.76 knots, and average during a four-hour run, 37.64 knots. From the standpoints of speed, radius of action, and armament, these Spanish flotilla leaders appear to be superior to the French and Italian types, in which the armament does not seem to justify their high displacements with the loss of speed which accompanies it. The Spanish authorities are continuing the construction of vessels similar to the *Churruca,* and in a short time Spain will be able to display on the Mediterranean Sea the most interesting and the fastest group of flotilla leaders in service.

GERMANY

From the German Press.—A new method of using gas as a fuel for dirigibles has been proposed by Curt Peters and Peter Schlumbohm.

In the reports regarding the flight of the *Norge* from Italy to Spitzbergen, it was stated that the landing of the airship was always effected with great difficulty. This experience therefore caused Amundsen to abandon the idea of landing at the pole. These landing difficulties were not the question of personal ability on Amundsen's part but were due to the imperfection of the airship. The benzine consumption during the flight makes the airship continually lighter (tests to obtain ballast water from the exhaust gases are still in their initial stages). The buoyancy must be greatly reduced by blowing off gas in order to be able to land at all. This process is technically very difficult. As the carrying capacity of the *Norge* had to be used completely for the great quantities of benzine, there was very little room left for ballast. There was also the danger of the ship not being able to rise again if she once landed at the pole, and a sacrifice of gasoline would have jeopardized the return journey. Amundsen's prospects would have been more favorable by using a larger airship, but then the general skepticism would have been justified owing to the above mentioned objective deficiencies of an airship operating with benzine motors. In our opinion these deficiencies can be obviated by using gas motors and gas-generating fuels which carry themselves. To cite a concrete example, in a 70,000 cbm. ship such as the *ZR-III* (*Los Angeles*), 30,000 cbm. hydrogen or helium which serve only to carry 30 tons of benzine (as in the American flight) could be replaced by 30,000 cbm. motor-driving gas, such, for instance, as acetelyn, illuminating gas, aethen, etc. The use of this fuel would not lighten the ship any during flight. The process can be varied by using two gases for operating the motors, one lighter and the other heavier than air. The simultaneous consumption of the gases keeps the ship at the same altitude; using the lighter gas would make it drop; the heavier would make it rise. The energy value of this 30,000 cbm. heating gas is approximately twice as much as that of thirty tons of benzine. This remaining 40,000 cbm. of inflation gas would keep the buoyancy continuously the same. The cruising radius would then be dependent only on the quantity of motor gas. A portion of this can be generated during the flight by chemical means. For example, the water condensed by the combustion of acetelyn could be used for the regeneration of acetelyn by the use of calcium carbide. The modern type of airship can be improved by deriving energy during the flight by exploitation of the exothermic reaction between balloon gas and atmosphere and the attainment of a constant buoyancy.

From a physico-chemical standpoint the use of benzine motors in airships is illogical.

A few days ago, Mr. Peter Schlumbohm came to see me and told me that he and the Zeppelin Company were having a controversy with regard to this new idea. He said that he and Mr. Burt Peters had put in an application for patents for an idea covering the use of two gases, one lighter than air and the other heavier than air, as described in the foregoing article. He said that Doctor Eckener claims that one of his chemists had hit upon the same idea at the same time and that they had also applied for a patent for use of the gas having the same specific weight as air. The idea is therefore different from that of Messrs. Peters and Schlumbohm.

Lately some articles have appeared in the newspapers to the effect that a new dirigible is to be built by the Zeppelin Company at Friedrichshafen in which the new gas fuel is to be employed. Two of these articles are as follows:

[Chicago *Tribune*. Paris edition]

A Zeppelin twice the size of the *Los Angeles* will shortly be built at Friedrichshafen it was announced here yesterday by Doctor Eckener, commander of the *Los Angeles* on her trip in October, 1924, to the United States. At the same time he revealed that an entirely new gas fuel has been discovered by Doctor Lempertz, chemist of the Zeppelin works. The new gas fuel, besides being superior to benzine, has the same specific weight as air and also considerably lessens danger from explosions.

It is believed that cruising radius of airships will be increased as well as the speed by use of the new gas, which will be carried in special gas cells. As soon as experiments with the new gas have come to a conclusion construction of the new Zeppelin will be begun. It is hoped that the new airship will be finished by August of next year.

[New York *Herald*. Paris edition]

The building of the immense Zeppelin at Friedrichshafen is renewing the discussion of the possibilities of replacing gasoline by nonexplosive gas as fuel. This idea of gas fuel was first considered here scientifically by two Berlin students, Peters and Schlumbohm.

The first investigation of these younger men was generally known to the public. Their earlier scheme was to fill an airship with helium and so control it that the craft would be made to rise and descend without losing either ballast or gas. The helium would be electrically heated and cooled.

The newest idea of Peters and Schlumbohm is to use not one gas like ethane with specific gravity equal to air like the new Zeppelin, but two gases, one lighter and one heavier than air.

When the airship is to ascend, then the heavier gas must be consumed by engines; when it descends, the lighter is consumed. When the carrying gas is helium, this method, combined with electrical heating and cooling, would altogether eliminate waste of the precious helium. It would also greatly simplify the whole problem of navigation. Only a small amount of ballast would be required for emergencies. The inventors also suggest that gas fuel be carried in chambers inside the helium. Fuel can explode only when in contact with air, and in case of an attack with incandescent projectiles the surrounding helium would act as a fire extinguisher. Thus the fire risk from all sources would be almost completely eliminated.

The German Seaplane Competition

The Aeroplane, 18 August, 1926.—The German Seaplane Competition at Warnemünde (Deutscher Seeflug-Wettbewerb 1926) began nominally on July 12. The closing date remained indefinite, because it had the peculiarity of depending on the badness of the weather. The obvious remark is that this requirement should not cause much delay, but the weather cannot even be trusted to be bad when wanted, and the organizers were prepared to have to wait a fortnight or so for a sea of the exact roughness required for the seaworthiness tests.

The competition was organized by the Deutscher Luftfahrt Verband with the approval of the German Air Council. Major von Eschudi was president of the organizing and prize committees. There were four big prizes: a prize of 250,000 marks for the main competition; a reliability prize of 65,000 marks, a prize of 50,000 for the best performances in main competition with German engines, and a prize of 10,000 marks offered by the Ministry of Posts. About thirty minor prizes were offered by individuals, institutions, and firms.

The last German seaplane trials were held in the summer of 1914 and were cut short by the outbreak of war. This year's program was much more extensive. The most important of the new features were the 4,000 kilometer coastal flights and the seaworthiness tests.

The aim of the organizers was to obtain from the competition as much benefit for German aviation as possible. They started from the standpoint that German aviation, whatever it may have gained by compulsory concentration on certain problems (and it would seem to have gained a good deal more that it often admits) had much to make up now that the allied restrictions have been removed and was not in the position to afford a straightforward seaplane race, with all the waste involved therein, or any competition based on one kind of performance only.

The simple speed or distance competition is apt to exclude useful types of craft and to encourage freak construction. The

Deutscher Luftfahrt Verband sought a means of embracing in its competition the widest possible variety of types, giving equal consideration to the various qualities that go to make an efficient seaplane, and at the same time retaining an attractive sporting element. Although it admitted imperfections in its scheme, it considered it had found this means to a considerable extent in a series of mathematical formulæ which would cover a page of *The Aeroplane*, but are based on comparatively simple principles.

The conditions were drawn up so as to include practically any craft of public value, from two-seater instruction machines and mail-carriers to quite large freight and passenger machines and to exclude only racing machines and what might be called outsizes "giant" seaplanes and toys unfitted for serious seaplane work.

The competition consisted of three phases. The first consisted of technical tests. The second stage comprised the coastal reliability flights. The total distance to be flown in the four days was about 4,000 kilometers, divided roughly into 1,000 kilometers a day.

The last phase was the severe seaworthiness test. Thus a competitor might complete the technical trials and the coastal flights in excellent style and yet be placed out of the running for the prizes if his craft was incapable of withstanding the test in such a sea.

The sea did in fact put in some useful elimination work and made the trials like an ordinary competition and less like an exercise in algebra. One got the impression at the start that some competitors might consider themselves lucky to get ashore with a fragmentary souvenir of their late craft in their hands.

The large proportion of foreign engines was noticeable. The competition was "national," and the craft had to be of German construction, but for easily comprehensible reasons foreign engines had been admitted. The restrictions on German aviation had the effect of diverting interest from the production of high-powered engines to useful experiments in aircraft design.

The weather, of which two aviators were the victims, was fairly consistent, and it was not necessary to wait long for the roughness and strength of sea and wind required for the seaworthiness tests. These tests were held on July 31.

Six machines remained in the competition; on that day three of them were eliminated by bad luck or the elements. The three surviving seaplanes were, in order of points gained throughout the competition:—Heinkel *H.E.5* (450 h.p. Napier Lion), pilot, von Gronau. Junkers *W.33* (230/310 h.p. Junkers *L.5*), pilot, Langanke. Heinkel biplane *H.D.24* (23/300 h.p. B.M. W. IV), pilot, Spies.

It took the mathematicians and the prize committee more than ten days after the end of the competition to settle this order and and the division of the prizes, although the regulations had permitted sheer chance to wipe some excellent performances off the

slate in less than as many minutes. It is only fair, however, to explain that a good deal of the delay was caused by a controller at one of the turning points, who sent his report to the chairman of his local aero club instead of the competition committee. The chairman went off for a holiday cruise and forgot about the report.

Thus, as was expected, a seaplane with a British engine won the first place. Nobody, however, up to the last day would have wagered more than a mark on two machines with two German engines being among the winners. The performances of these two German engines must be regarded as among the most interesting results of the competition, although it was not, of course, intended to be particularly an engine trial.

The conditions, like those of every air race or competition, have come in for a considerable amount of criticism, which may be summed up to the effect that the organizers and the mathematicians were too ambitious. When I was at Warnemünde during the coastal reliability flights one of the most prominent of those concerned in the arrangement of the competition remarked regretfully upon the utter impossibility of testing the competing craft to the degree contemplated. Far too much, he said, depended on the engine, the pilot, and chance. Or he may have said chance, the engine and the pilot. I forget the order. The aptness of this remark and of certain other observations which shall be discussed later, may be judged better with the aid of the final results of the three stages of the competition.

Six out of the eighteen machines entered did not take part in the competition for one reason or another. The L. F. G. *V.59* did not turn up at Warnemünde. It was only held in reserve in case one of the two others should not be ready in time. The Caspar *C.29* was unfortunately destroyed by fire at the works.

It was understood that the Dornier flying-boats were withdrawn because the firm was not quite satisfied with the trial flights with the new engines and airscrews and preferred not to run risks of anything but the best possible performances. The machines were, however, present at Warnemünde; they were used occasionally by members of the organizing committee for control work, and they took part unofficially in the seaworthiness tests.

The big Gerbrecht 8-seater passenger seaplane with the three Thulin engines could not be got ready in time.

The Udet *U.13* (420/600 h.p. B.M.W. VI) arrived complete, but too late to accomplish the technical tests by the appointed date. It was a pity that there was no opportunity to observe the performance of this engine.

The Rohrbach flying machines underwent some of the technical tests but were unable to complete them. Thus all the flying-boats had dropped out almost at the beginning. This caused much disappointment among those who had been looking forward to com-

paring the performances of seaplanes and flying-boats in the seaworthiness tests.

However, one of the Rohrbachs as well as the Dorniers took part in these tests unofficially. The comparison was not so valuable as had been hoped, mainly because the sea became rougher during the tests and the flying-boats did not attempt the full program.

One should, however, begin at the beginning, with the technical tests.

I discovered at Warnemünde that hardly anybody either wanted, or intended to try, to understand the mathematical formulæ which had been so painstakingly worked out by the Institute for Aeronautical Research, although they were of absorbing interest to the mathematicians. Having failed to strike a spark of enthusiasm from members of the organizing and "sport" committees or others interested more in flying than in formulæ, I attacked the experts themselves.

I believe that Professor Hoff, the Director of the Institute, made the system clear to me. He was remarkably patient. But I should hesitate to undergo an examination in it. The mathematicians sought to give equal consideration to each quality or performance, speed, climbing capacity, commercial radius, taking-off speed, economy of construction and, in the second stage of the competition, reliability.

A serious omission was, perhaps, alighting speed. The "ideal" speed to be expected from a craft was calculated from the weight empty, radius and climbing time. Against this was set the "measured speed," which was the medium between the highest speed measured in the technical trials and the average travelling speed over the coastal courses.

The technical tests were held between July 12 and July 23. The weather during that period was fairly good. Everybody seems to have been satisfied with the measurement of the taking-off speed by the film method described some weeks ago. Difficulties arose, however, in the case of the climbing time from 1,000 to 2,000 meters.

Nobody took longer than the prescribed fifteen minutes and had to reduce his load, but the Heinkel competitors complained that they carried out their climbing tests under worse conditions than the Junkers machines, in spite of the fact that each competitor was entitled to three attempts. With the aid of the mathematicians the performances were supposed to be adjusted in relation to what is described as the "normal day." This appears to be that aeronautical impossibility, a day without a breath of air.

Further algebraical adjustments were made later which corrected the balance somewhat more to the satisfaction of the complainants. But one thing is clear after this competition; climbing

time can never be measured satisfactorily unless all the competitors go up at the same time.

The difficulties of arranging such a simultaneous trial, even at an excellent combined seaplane station and airdrome like Warnemünde, are considerable. And even if they were overcome there would still be inequalities to baffle the scientists; the difference, for instance, between the upward movement of the air over land and water due to the differences of temperature. All the machines would have to carry out their trials strictly over one or the other, and there would still remain to be considered those mysterious and curiously restricted local air movements of which certain birds appear to know how to take advantage.

Incidentally, it might be argued that any slight disadvantage which the Heinkel machines met with in the climbing tests could perhaps be set against the undoubted advantage they had at being at home at Warnemünde. Their works and sheds are on the spot, 100 yards inland from the alighting place, whereas the Junkers and L. F. G. competitors were in the position of visiting teams.

The second stage of the competition, the coastal reliability flights, began on Saturday, July 24.

They occupied four days. The course for each day was roughly 600 miles. The course for the 24th was from Warnemünde to Emden *via* Heiligenhafen, Kiel, Holtenau, Rendsburg, Brunsbüttelkoog, Hamburg, Harburg, Cuxhafen, Neu Werw, Bremerhafen, Elsfleth, Bremen, Aussenjade lightship, Wilhelmshafen, Wangeroog, Norderney, Borkum, and back as far as Norderney, where the night was spent. Of the places mentioned Hamburg, Bremerhafen and Emden were compulsory alighting places, Wilhelmshafen was a refuelling station and the rest were turning points.

The return from Norderney the next day was by a different route. The third day's course was to Memel *via* Pillau and back to Pillau for the night, the return journey from Pillau being made by a different route on the fourth day. The courses were not easy.

The ten machines which had completed the technical tests left Warnemünde at 7 A. M. The start was a spectacular affair. All ten rose into the air almost together behind the starting line. When the first Vérey light went up they shot away as at the start of a horse race, all ten being off before 7:03. The weather was excellent in the morning, but by evening local thunderstorms developed.

The heroes of the day were Langanke and his crew in the Junkers *W.33*. Owing to engine trouble they had to alight soon after the start. They decided that the engine would have to be changed. Arriving back at Warnemünde at 9:15 A. M. they substituted another L.5 engine, left at 2:45 P. M. and arrived at Wilhelmshafen that evening. Leaving the next morning at 4:15,

they completed the course to Emden and returned at once to Warnemünde.

With a few short intervals they were thirty-seven hours in the air. Although they lost some hours' official flying time and were penalized for missing one turning point and for changing their engine, they caught up and were able to leave on the Monday morning with the rest. The effort was worth making, as they took second place.

Von Dewitz, in the Heinkel monoplane with the Gnome-Rhone Jupiter engine, maintained the lead he had obtained in the technical tests, though he was penalized for missing a turning point. This he did unwittingly, having lost his map overboard.

On the evening of the twenty-fifth all the competitors were back at Warnemünde except Geissler, in one of the Heinkel biplanes, and Haase in the L. F. G. *V.60.* Geissler had dropped out of the competition, having damaged his machine in alighting beyond repair.

During the return from Norderney Haase was held up at Tönning by engine trouble. It was during a sporting attempt the next day to keep in the competition, although nearly twenty-four hours behind, that he lost his life. The weather was distinctly bad; a strong, gusty wind was blowing and the sea was rough. Haase left Tönning shortly after 10 A. M., but he had to descend again at Mürwik. After further strenuous work on the engine he and his mechanic, Kolbe, were ready to start again, but it was not until five o'clock that the wind had dropped sufficiently for the local competition controllers to let them go. Permission was granted with reluctance, and they were advised by telephone from Warnemünde to follow the coast.

They were almost twenty-four hours behind and had practically no hope of a final place in the competition. Nevertheless, if they could have reached Warnemünde that night they would still have been in the competition. They set off straight across the open water. Another engine defect forced them down into the rough sea. After two hours the machine capsized. Haase and Kolbe each clung to a float.

That evening and all the night through aircraft and German and Danish destroyers looked for the wrecked seaplane in vain. Towards morning Haase became weak and Kolbe frequently had to pull him back as he slipped off the float. Eventually Kolbe's strength gave out too, and a short time before help came Haase was washed off his float and was not seen again.

The other casualty occurred that same day, when von Reppert, in the L. F. G. *V.61* made a forced descent, not due to engine trouble, but to physical exhaustion after the strain of flying through the bad weather. His machine broke up. He and his two mechanics were picked up by a destroyer, but one of the mechanics had swallowed too much water to be revived.

On account of these unfortunate accidents a good deal of criticism has been directed at the organization which does not seem entirely justified. Haase, one of the most experienced of German seaplane pilots, was, after all, practically out of the competition. He lost his life in a sporting effort undertaken, so far as can be gathered, on his own responsibility, and he would probably have been the last to reproach the organization. In the other case the crew of the L. F. G. appear to have been picked up as promptly as could have been expected and it was bad luck that one died later.

The seaworthiness tests held later were considered severe and the roughness of the sea prescribed was what is known here as "Seegang 4." On the day of these accidents the roughness was, according to this German system of reckoning, 6, so that there is, perhaps, some reason on the side of those who consider that flying should have been stopped that day.

"Realism" still has a strong hold in Germany, as was shown near Berlin recently during some Red Cross evolutions, in which school children flung themselves by arrangement from a ship into a lake, and, something going wrong with the rescue plans, a boy of 12 years was drowned.

However, six out of ten machines finished the 2,500 odd miles through changeable and trying weather. In addition to the accidents already mentioned, Zimmermann, who had done very well, came down in a rough sea and lost his machine. He and his crew were picked up.

Six machines remained to take the seaworthiness tests on July 31 when the required "Seegang 4" and wind 5 were available. Each machine had to make three starts and three descents and to describe a figure of eight on the water.

Von Gronau began and accomplished his tests without difficulty or damage. His colleague von Dewitz damaged both floats the first time he alighted. A tug, told off to assist, rammed the seaplane, which sank. The tug picked up the crew. Thus in a few minutes the excellent record of von Dewitz, who had led practically throughout the competition and upheld his reputation as perhaps the best of the German seaplane pilots, war and post-war, was wiped out by circumstances above which he had no control and in which the construction of his craft and the efficiency of his engine were of no account.

It was simply an accident. If he had not been rammed he would right well have repaired the floats, as did other competitors.

Langanke and Spies completed the first tests successfully. Friedensburg and Starke both had floats damaged in the first descent. With von Dewitz's fate fresh in his mind, Starke declined assistance from sea craft. Both repaired the damage, but

in the meantime the sea had become rougher and the proceedings were stopped until 4 P. M.

Freidensburg again damaged a float and gave up. Starke completed three starts and two descents, but failed to alight a third time and therefore dropped out of the competition.

It had been laid down that, although there would be minor penalties for damage sustained, the seaworthiness test could only be passed or not passed. There was to be no classification. The three survivors completed their maneuvers on the water without difficulty.

In spite of the suspension of the tests for several hours it cannot be said that all the competitors had the same sea and wind to contend with. The Rohrbach flying-boat alighted once and rose again. The Dorniers both alighted safely but owing to the roughness of the sea could not get up again. It was regrettable that the flying-boats did not attempt the regulation three descents and starts when the weather improved. The comparison with the seaplanes was not particularly useful in the circumstances.

These seaworthiness tests were drastic, and of the three factors mentioned by my distinguished friend luck would seem to have been the deciding one. The competition was a patchwork of science, skill, sport, and chance, and in the end it is hard to say what it proved. If it proved anything, it would seem to be that the Heinkel *H. E.5* with a British engine was the commercially efficient mail-carrier that was sought, for, leaving aside the pure bad luck of von Dewitz on the last day, two of these machines had the first two places.

At one stage during the coastal flights I heard a wag suggest that it looked like a competition for the testing of British engines in German seaplanes. The competition was "national," and the craft had to be of German construction, but for easily comprehensible reasons foreign engines were admitted. The restrictions on German aviation had the effect of diverting interest from the production of high-powered engines to useful experiments in aircraft design. One of the main objects of the competition was to show where the German aircraft engine industry stands after the years of restriction and to obtain indications of the best line of development now that obstacles are removed.

Of the ten machines which started the coastal flight, five had British and five German engines. The proportion was maintained. Of the six survivors of those flights three had British and three German engines; of the three survivors of the whole competition the first had a British engine and the other two had German engines.

It might perhaps be argued from the results that the Germans can reasonably go ahead along their present lines, taking advantage of the freedom from restrictions to increase h. p. for commercial safety. One of their chief complaints against the re-

strictions has always been that they were deprived of a reserve of power.

The chief lesson of the competition would seem to be that it is hardly reasonable to expect, as the organizers hoped, to be able to embrace in a competition the widest variety of types, to give equal consideration to the various qualities that go to make an efficient seaplane and at the same time to retain an attractive sporting element. Either you must have a sporting competition or race, or you must have a cold scientific trial. The two do not mix.

The technical tests at Warnemünde were of the greatest interest by themselves, and would have been even more interesting if the regulations had permitted an extension of the time limit so as to give the Udet, the Rohrbachs and Gerbrecht time to take part. If the tests had stood alone this would have been possible. Tests lasting over several months might have been still more useful.

Other trials have been suggested by those interested in the technical development of German aviation, such as the testing of different types of seaplanes equipped with the same engine. The public, on the other hand, would be better served with a straightforward one-day seaplane race, a frankly sporting affair unmixed with algebraical exercises, and it would not be surprising, if, next year, it got it.

BRAZIL

The Brazilian Scout Cruisers "Bahia" and "Rio Grande do Sul"

The Shipbuilder, August, 1926.—In view of the present difficulty which British shipbuilding firms are experiencing in competing with Continental ship builders, it is pleasing to make reference to the successful re-conditioning and re-engining of the Brazilian scout cruisers *Bahia* and *Rio Grande do Sul,* for which a British firm—Messrs. John I. Thornycroft & Co., Ltd., of Southampton—have been largely responsible.

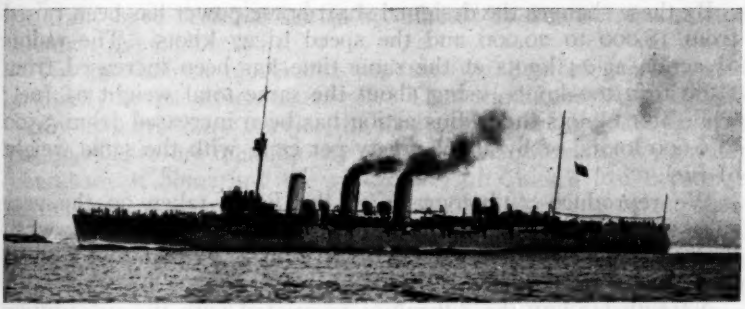
To develop national resources, the Brazilian Government entrusted the re-conditioning to the Companhia Nacional de Navegação Costeira, the well-known shipowners, of Rio de Janeiro, who also possess a shipbuilding yard and dry dock in Rio harbor, and have built a number of merchant vessels. This company carried out the repairs and alterations to the hulls, and installed the new propelling machinery and boilers constructed at Southhampton by Messrs. Thornycroft.

The *Bahia* and *Rio Grande do Sul were* built in 1906 by Sir W. G. Armstrong, Whitworth & Co., Ltd., at Elswick, and engined by Messrs. Vickers, Limited, Barrow-in-Furness; and the fact that these warships after twenty years service were considered worth re-engining is a tribute to the workmanship of the British

firm responsible for their construction. The following are the leading particulars of the vessel as originally designed:

Length overall	401ft. 6in.
Length B.P.	380ft. 0in.
Breadth moulded	39ft. 0in.
Depth moulded	23ft. 6in.
Mean draught	13ft. 6in.
Displacement (tons)	3,100
Shaft horse-power	18,000
Speed, knots	26.5
Coal-bunker capacity (tons)	650
Radius of action (knots) at 24 knots	1,500
Radius of action (knots) at 10 knots	3,500

The propelling machinery consisted of Parsons reaction turbines directly driving three screw propellers, the central propeller being



THE BRAZILIAN SCOUT CRUISER "BAHIA," AS RE-CONDITIONED

actuated by a high-pressure turbine and the two wing propellers by low-pressure turbines. Cruising turbines were also provided on the wing shafts, and the astern turbines were incorporated in the low-pressure casings. Steam at 250 pound pressure was supplied by ten coal-fired water-tube boilers, the total heating surface being 35,000 square feet.

It was decided to convert both ships to burn oil fuel, replacing the ten original boilers by six Thoryncroft water-tube boilers, and the five direct-coupled turbines with three of the geared type and of somewhat higher power.

The new boilers have a total heating surface of 26,000 square feet, the boiler pressure being 250 pounds. The steam drums are 4 feet 2 inches in diameter by 11 feet 0 7/16 inches long. The oil-fuel gear is of the standard Thornycroft pattern, and the sprayers and deflectors have been specially designed for heavy oils.

The new turbines, which are of the Brown-Curtis type, have been designed by Messrs. John I. Thornycroft & Co., Ltd., in association with Messrs. John Brown & Co., Ltd. Two cruising

stages are incorporated at the forward end of the high-pressure turbine, and consist of one three-row and one two-row velocity compounded wheels. These are followed by the main high-pressure turbine, consisting of one two-row and three single-row wheels. Each low-pressure turbine has simple impulse stages throughout. The reversing turbines, on the wing shafts, each consist of a three-row velocity compounded wheel, the central propeller being idle when the vessel is going astern. Provision is made for a supply of steam directly to the low-pressure turbines to facilitate maneuvering. The old intermediate and propeller shafts with their brackets have been utilized in the new arrangement, and the propeller speed has not been altered; but new propellers have been designed and fitted to suit the increased power developed. Both the high and low-pressure turbines run at 2,500 r.p.m. when developing full power. Michell thrust blocks capable of taking the full propeller thrust have been provided.

By these changes the designed shaft horse power has been raised from 18,000 to 20,000 and the speed to 27 knots. The radius of action at 24 knots at the same time has been increased from 1,500 to 2,400 knots, using about the same total weight of fuel; while at 10 knots the radius action has been increased from 3,500 to 6,600 knots, or by about ninety per cent, with the same weight of fuel.

We reproduce a photograph of the *Bahia* taken on the very successful trials which were carried out a few weeks ago, when the power developed was 22,000 S.H.P. at 474 r.p.m. and a speed of 27 knots was attained.

Notwithstanding the difficulties associated with the substitution of one set of propelling machinery for that of another type in an existing hull, the re-engining of the *Bahia* and *Rio Grande do Sul* prove unmistakably the enormous strides made in the design of marine steam turbine machinery and boilers during the past twenty years.

CHINA

Leaders and Armies of Rebellious China

National Review, August.—Are we witnessing in China the rise of a new military power whose strength will upset the present situation in Asia and possibly throughout the world? Since the 1911 revolution overthrew the Manchu Monarchy, China has had one civil war after another. Each by comparison with the previous one shows the armies to have progressed in organization, equipment, armament, ability to handle weapons, tactics, leadership by the officers, and strategy on the part of the high command.

Coincident with this development of military power, has been the reawakening of the spirit of Chinese nationalism. However, here is found an unusual phenomenon. These two developments, instead of being intermingled, each causing the advancement of

the other, have occurred in two independent, parallel streams. Only recently have they commenced to approach each other.

The development of the military power has been carried out by military leaders determined to enforce their will in order to further their own interests. For generations the soldier has been looked down upon in China. As a consequence, the mass of the armies have been made up of the most ignorant class of the population. Also, the Chinese military system is still feudal in its moral aspect. The enlisted men and the majority of officers give their loyalty to individual leaders rather than to the state or to some abstract idea expressing a cause. Just as in mediæval Europe, so in twentieth-century China a unit follows its leader, where he goes they go, if he changes from one higher leader to another his men do not bother their heads about the reason. This is true even though it means serving in the army against which they have but recently fought. Under such conditions the armies naturally have been the last to be affected by a movement started amongst the intellectuals.

The nationalistic movement was started and is being propagated primarily by the educated classes. They were brought up to look down upon military service, or at least not to consider it as a career. Therefore the majority of the Chinese working for greater liberalism at home and the restoration of China's lost sovereign rights are content with peaceful means. If they reason to a certain conclusion they think the other side should be convinced and yield. They seem incapable of understanding that their opponents consider "the special privileges" they are asked to give up to be "rights," which nothing short of force can make them abrogate. In other words, the majority have the "peace minds" mentioned by H. Wickham Steed in *Through Thirty Years*. They have not as yet an understanding of the "phenomena of force."

However, in the past few years they have had frequent examples of the fact that the sword is mightier than the tongue and the pen. They have seen the ease with which Chinese generals overturn existing situations and establish new ones to suit themselves. This is commencing to bear fruit. Student cadet corps are being formed in different parts of the country. The sons of the educated class are beginning to realize that the propagation of their cause necessitates their taking up military careers.

At the same time, a number of the higher ranking military leaders are becoming disgusted with China's internal condition and lack of external position in the world. They are getting away from feudal military ideas. They are beginning to understand that the function of an army is, not to further personal ambitions, but to carry forward internal and external political policies when peaceful means fail.

As the two streams of military and nationalistic development, hitherto running parallel to each other, mingle, the time approaches

when China will have a stable government. Also a national army will be created, which, like Japan's, will plan an important part in Asiatic affairs. Probably in time a navy will also appear, though there are few indications of this happening in the immediate future.

Marshall Chang Tso-lin, commonly called the Manchurian war lord, is for the time being the dominant military force in China. At present in partial eclipse, but almost certain with his specially trained troops again to play a dominant part, is Marshal Feng Yu Hsiang. Commonly called the Christian Marshal, he is of a totally different type from Marshal Chang. Between these two extremes stands Marshal Wu Pei-fu. The civil leaders are all well-educated men of considerable world experience gained in foreign colleges, the diplomatic service, and international conferences. The most prominent at the present time is Dr. W. W. Yen, now Premier.* Dr. C. T. Wong, Foreign Minister until the recent entry of Marshal Chang's troops into Peking compelled his hurried departure for Shanghai, still stands amongst China's foremost advocates for the restoration of her sovereign rights. Dr. Wang Chung-hui as China's principal representative on the Extraterritorial Commission has to deal with the questions over which the Chinese and foreigners most disagree. Mr. George Hsu-chien, one of Dr. Sun Yat-sen's greatest friends, is commonly considered to be the most radical leader in China today.

Approximately a year ago Marshal Chang had extended his power south from Manchuria through the provinces of Chihli, Shantung, and Kiangsu. Thus he ruled from the Amur River in the North to Shanghai in the South. He made his faithful lieutenants, Generals Li Ching-lin, Chang Tsung-chang, and Yang Yu-ting, military governors of Chihli, Shantung, and Kiangsu, respectively. The occupation of the first two of these provinces cut off Marshal Feng from the sea. He was thus compelled to subsist and equip his force from the meager supplies to be raised in the northwest frontier provinces and brought by camel trains and American automobiles across Mongolia from Siberia. Marshal Wu, decisively defeated by Chang in 1924, was virtually a fugitive well up the Yangtsze valley. Without an army and cut off from the sea by Chang's occupancy of Shanghai, he appeared to be in a hopeless position. Thus Chang appeared on the road to become the great military leader who would unify China by force. In an interview granted the writer he indicated this as the only possible solution for China's troubles.

Unexpected Difficulties in Uniting China

By December, 1925, conditions were completely reversed. Yang Yu-ting had been driven out of Shanghai. Chang Tsung-chang

* Shortly after this article was written, Premier Yen resigned from the Cabinet.

was holding on to part of Shantung with difficulty. Marshal Feng's army was successfully attacking General Li Ching-lin in Tientsin. General Kuo Sung-lin, sent to attack Marshal Feng, had revolted and was marching on Moukden, Chang's capital. This city was in an uproar, for it was universally believed that Chang's downfall had come, especially as it was known he had turned his cash over to the Japanese for safe keeping and was preparing for flight. A month later Kuo had been captured and shot. By early summer the Marshal was again on the offensive. He reoccupied Chihli, thus reestablishing land communication with Shantung. His troops entered Peking on the heels of Feng's force retiring toward Kalgan.

The causes of these remarkable and sudden turns of the wheel of fortune excellently illustrated the development of the military and nationalistic currents in China and their interrelationship.

Marshal Chang extends and holds his power by force alone. For years he has been busy building up a modern army of approximately a quarter of a million men. As a leader of Chinese irregulars, in the pay of Japan during the Russo-Japanese War, he saw the irresistibility of a modern army. He also had brought home to him the importance of controlling a supply of war munitions. Consequently he spends large sums in building and maintaining arsenals. Knowing the inefficiency of the average Chinese officer, he employs Japanese and European instructors. Also, he sends a considerable number of Chinese officers to Japanese military schools. The Japanese instructors are by far the most numerous. It is commonly believed that among the Marshal's troops are a number of former Japanese officers and noncommissioned officers wearing Chinese uniforms and speaking Chinese.

The Marshal has more than one hundred airplanes. A reasonable number of his officers have become aviators. The instructors are Frenchmen who served in French aviation during the World War. To increase the number under instruction, student aviators after learning to fly are now sent to Japan to complete their course.

Marshal Chang's army has about the same proportion of light field artillery which obtained in most armies at the outbreak of the World War. He has only a few medium-caliber guns and no heavy ones. This was true in 1914 of all field armies except the German. However, thanks to General Sutton, an Englishman, the Marshal now has a greater proportion of trench mortars than has any army today. These mortars will fire with reasonable accuracy up to three and four times the range possible for the same caliber during the World War—a result of Sutton's genius. The instructor in their firing and tactical use is an able artilleryman, Baron Taube, formerly in the Danish Army. A large number of batteries of these mortars distributed throughout Chang's Infantry

line during the battles of the 1924 campaign contributed materially to Marshal Wu Pei-fu's defeat.

Chang organized a force of "White" Russians from the crowd of refugees who poured into northern China because of the Russian Revolution. This force expands and contracts, depending upon Chang's finances and the amount of fighting to be done, but is never less than a brigade of six Infantry battalions. Many of them had experience in the World War and later with Kolchak in Siberia. Imbued with a fighting spirit, they are generally used as shock troops.

After Chang's troops were driven out of Shanghai, a force of Russians and Chinese was sent south from Shantung to meet the steadily advancing enemy. The Russians numbered 312. They manned two armored trains. The Chinese detachment was many times greater. It marched on both sides and at some distance from the two trains. The mistake was made of sending Chinese troops taken over at the time Shantung was occupied. These disloyal soldiers had arranged to join the advancing enemy when the two forces had drawn near each other. The enemy was to wait in ambush on both sides and at a considerable distance from the railway. When the advancing force had entered this trap the Chinese detachment was to attack the trains from both sides. The hidden enemy was then to join in the attack. At a point where the trains were stopped by the track being torn up the Russians were suddenly fired upon by their own Chinese escort. They returned the fire and endeavored to back but found the track torn up behind them. About this time the shelling to which the trains had been subjected set them on fire. Concentrating their machine gun fire to their left, where the attack was the heaviest, the Russians disembarked to the right and attacked with rifle, hand grenade, and bayonet. They broke through, taking their wounded with them, and four times during the retreat they attacked to the rear to pick up wounded. The Chinese promptly shot all prisoners, wounded or unwounded. After marching one hundred and fifty miles the survivors, carrying their wounded, finally reached safety. Of the 312 who started, 113 returned. Many stories were current that the Chinese tortured the captured and mutilated the dead. The Russian survivors deny this, however.

Marshal Chang's troops are nominally a part of the Chinese Army. They wear its uniform. However, all the details of organization, equipment, and personnel are handled by the Marshal and not by the War Office at Peking. No oath of allegiance is taken. The question of whom the personnel serves comes down to a mere matter of employment, like getting a job in civil life. The Marshal always remains in Moukden. Even there he is seldom seen. His son, General Chang Hsuehliang, an attractive young man of modern habits, always commands in the field. How-

ever, he seldom comes in intimate contact with the same troops over a long period of time. The result was that, when the test came, a large proportion of the best Moukden troops turned out to be not Chang's but General Kuo Sung-lin's troops.

At the time he lost Shanghai, Chang sent 70,000 of his best troops with ninety guns to Chihli Province. This to face Marshal Feng's army, which up to that time had taken no active part in the hostilities. The commander of this force was General Kuo Sung-lin, an educated, competent soldier. One of the Chinese military leaders whose interest went beyond personal ambitions, he had encouraged the growth of the liberal and nationalist movements. His wife was a modernly educated woman with similar interests. Their home in Moukden was a center for the liberal element, which included a number who had been educated in American colleges. His enemies labelled this Bolshevism and did their best to secure his downfall on that score. They probably would have succeeded long before had it not been for his military qualities and the friendship of the Marshal's son, himself inclined to liberalism. There appear to have been two causes for General Kuo Sung-lin's decision to revolt: first, he became convinced that his enemies had finally persuaded Marshal Chang to get rid of him; and second, his liberal friends insisted that reform could come only by driving Chang from Manchuria. There is also evidence to show that merchant and agricultural societies urged him to act.

He revolted, carrying with him his troops except for a few officers, and marched on Moukden. In spite of the bitterly cold weather—comparable to that of Montana in the winter—his army marched north in good order and without desertions. Their only rail line of communication was the Tientsin Railway, along which the retreating enemy had blown up most of the bridges.

China's Rebels Warned by the Japanese

Immediately the Japanese began strongly reenforcing their Manchurian garrisons. They soon handed Kuo an ultimatum forbidding him to enter or to cross an indicated zone along the South Manchurian Railway west of Moukden. Marshal Chang began digging trenches and preparing a strong position along the Liao River, parallel to and just outside of the forbidden zone. The Japanese ultimatum forced Kuo to approach Moukden from the west and therefore to attack the prepared Liao River position from the front. The attack began successfully, the first enemy positions being taken. It was held up, however, by the main position. At this critical stage both Kuo's flanks and his rear were turned by thousands of North Manchurian cavalry. Attacking mounted at a gallop, they dispersed or captured a considerable portion of Kuo's force. The units which held together retreated to the south.

The writer was with a colonel of field artillery at the moment when he and his entire regiment were captured. Both the colonel and his regiment would have passed muster in any war army. He knew his business as did his well-disciplined regiment.

The defeat took place on the second day of the battle. That day and for the two following ones the town of Hsin Min-fu on the edge of the battlefield was in a state of disorder. The streets were full of the abandoned wagon trains and equipment of Kuo's army. The trains were looted by soldier and civilian. In some cases the civilians were driven off by cavalrymen galloping up firing their pistols. House-to-house visits with frequent forcible entry were made in search of hidden defeated soldiers. There was looting here and there, but none on a wholesale scale. There was a considerable amount of indiscriminate firing, mostly in the air, to celebrate the victory. On the whole there was more disorder than would obtain with the best disciplined American or European troops. There was nothing like the disorder which takes place in Mexico under similar circumstances. On the third day, General Chang Hsueh-liang, the son of the Marshal, entered the town and promptly restored order, shooting several looters and putting strong patrols in the streets. I do not believe that any fair-minded foreigner, with sufficient war experience to make him a competent judge, would criticize the general conduct of the Chinese during this affair.

As a consequence of Kuo's defeat Marshal Chang became the center of a storm of abuse and censure from all China because it was believed that he had virtually sold Manchuria to the Japanese to get the help without which he would have been defeated. However, Chang, still believing in the supremacy of force, reorganized his army and made an alliance with his former enemy, Marshal Wu Pei-fu. The latter had finally succeeded in getting an army together in the neighborhood of Hankow. Marshal Sun Chuan-feng, a former general who came into prominence by driving Chang out of Shanghai, was persuaded to become neutral. Having just become a Marshal and being busy in securing control of the five provinces in his immediate vicinity, he was entirely willing to have the three senior and more prominent Marshals occupied elsewhere getting after each other. Chang and Wu advanced and by their superior numbers and his lack of ammunition forced Marshal Feng out of Tientsin and Peking, back towards Kalgan. Chang occupied Peking.

Despite their telegrams, their newspaper articles, their speeches, their protests at the time of Kuo's defeat, the intellectuals did not take up arms. They remained bystanders and watched Chang regain power by force. The more prominent fled. The less prominent are hoping to be overlooked in the crowd. One editor who was a bit slow was caught and summarily shot.

Marshal Feng Yu Hsiang is a new type, produced by present-day conditions in China. Born the son of a non-commissioned officer, he started life as a private soldier without education, friends, or influence. He has fought his way step by step to his present position. When a colonel stationed outside of Peking he became acquainted with some native Christians. Of a serious nature, always trying to educate himself and profoundly discontented with the inefficiency, dishonesty, and selfishness which permeated Chinese official life, he was attracted to Christianity. He soon joined the Methodist Church. Christianity is regularly preached to his men and officers, with the result that a considerable number have become Christians.

Unlike the average Chinese officer, Feng takes a deep personal interest in everything concerning the physical, mental, and spiritual welfare of his men. To insure having good material he will not enlist any former soldiers. He wants no ex-bandits preaching the advantages of looting. He takes young men straight from their farm or city home. From the beginning of their training, they are taught that they are soldiers of the Chinese Republic, that they must fight for that Republic alone and never for an individual. They are also taught to respect the rights, property, and persons of the civilians. Their military training, while not equal to the highest American standards, is excellent considering the facilities possessed. They are kept in good physical condition. Football, races, sports and gymnastics of all kinds are in evidence everywhere. The officers are reasonably well trained. Whether in garrison or in the field they are always looking after their men—something unusual in China.

Feng's troops were put to a test last December when they drove General Li Ching-lin out of Tientsin. They had to carry three lines of modern trenches held by troops well equipped with a modern armament and plenty of ammunition. Feng's force was something under 100,000 of all arms. His loss was between 12,000 and 13,000 killed and wounded. This meant a loss of from 16 to 18 per cent for some of his infantry units. A force which will take such a loss and persist in the attack is not to be despised. Wherever his troops went the civilian population testified to their good behavior.

Pressing Bandits into Military Service

Marshal Wu Pei-fu is not a self-made man, as are Chang and Feng. He is one of the regular officers who, after graduating from a military school, have advanced grade by grade. Personally courageous and a good tactician, he does not rank at all high as a strategist. The troops directly under his supervision are fairly well disciplined and trained. The bulk of his force, however, is always made up of hastily raised and poorly equipped and trained troops. Large numbers are in reality bandits who, for pay and bet-

ter chances of loot, join the army. They put little spirit into combat, and generally melt away when a real struggle begins and take to looting the countryside.

The three Marshals differ materially in their characters and in the opinion of them held by the public. Chang is a quiet, determined man who keeps by himself. His will is law. He will brook no opposition and will go to any length to break his opponents. He is extremely ambitious. The people under his control fear him. Throughout China as a whole he is unpopular. Marshal Feng is equally determined, but less likely to act as the result of his passions or desires. He weighs every move and always waits for the most favorable opportunity. He constantly is seen by the civilian population and by his troops. He frequently addresses large gatherings of his officers and men. He is respected and admired. At the same time his edicts against smoking, drinking, and gambling, and the generally puritanical methods of life which he endeavors to enforce prevent his being popular.

Marshal Wu Pei-fu is a typical Chinaman. Like all Chinese gentlemen he dearly loves to gather his friends around him for banquets which would more than satisfy any epicurean the world over. He takes life as he finds it and does not interfere with the habits nor worry about the woes or misconduct of the people about him. This, together with his physical courage, makes him personally popular with all classes of Chinese—which is far from meaning that they lend him practical support when he needs it.

Marshal Chang believes in autocratic rule. Many believe he hopes to sit on the throne of China, others that he intends to restore the Manchus and be the strong man behind the throne. Marshal Feng abhores monarchy. He insists that any form of communism or bolshevism is impossible in China. His actions seem to bear out his statement that he is a strong believer in a republic. Marshal Wu insists he believes in a republican form of government. His actions indicate him to be largely an opportunist.

All the Marshals finance themselves primarily by taxation, sometimes forced, of the districts under their control. Whichever one is in control of Peking augments his resources from such funds as the national government may have managed to collect. At various times Japanese sources are reported to have aided Chang, Russian ones Feng, and British ones Wu.

The weakest point in the Chinese armies is the lack of good officers in the company and field-officer grade. This is slowly being corrected as young men are now commencing to look upon the army as a career. The chance to go to foreign military schools is helping. At the present time there is a considerable number of Chinese officers who are graduates of Japanese military schools. There are eight Chinese graduates of West Point, our

military academy, all of whom, though still young, have attained field or general-officer rank.

During one of the recent civil wars one of our officers stationed with our Fifteenth Infantry at Tientsin was taken seriously ill. The nearest place at which the delicate operation necessary could be satisfactorily performed was the Rockefeller Institute at Peking. Communications, however, had been cut by troop movements. One of the Chinese generals whose troops were in the vicinity was a classmate at West Point of the sick American officer. On learning of the matter he promptly turned over his private car and had the sick officer rushed to Peking, thus saving his life. Some time afterwards, when the officer, fully recovered, had returned to Tientsin, the army to which his Chinese friend belonged was decisively defeated. Soon after, a travel-stained and haggard Chinaman in civilian clothes appeared at the gate of the American barracks and asked to be shown the quarters of the officer who had been operated on. As far as the world knows he disappeared upon entering them. Rumor has it that he was the Chinese general and that his American classmate kept him hidden until one dark night when he was able to leave for a more friendly part of China.

Sixty years ago a small American or European force could successfully land anywhere in the Far East, regardless of armed resistance on the part of the natives. Japan, Korea, and China were all scenes of combat proving this. Japan was the first to realize that she must become a modern military power if she was to retain complete independence. The lifetime of some of her present-day leaders has witnessed the development from feudal Japanese armies to the armed forces of a first-class military power.

Twenty-six years ago this summer, at the time of the Boxer uprising, 20,000 American, British, French, Russian, and Japanese troops fought their way from Tientsin to Peking. The immensely more numerous troops they whipped were practically without artillery and were badly equipped as infantry. They knew nothing of modern methods or tactics. Even in appearance they belonged to a bygone age. A continuation of the improvement which has taken place, will see China a first-class military power before the next twenty-five years will have passed.

ENGINEERING

Electrolytic Iron

Engineers and Engineering, August, 1926.—For millenniums, man has used fire for extracting iron from ore. To bring together ores, fluxes, fuels and other supplies at suitable places in quantities to satisfy modern needs necessitates transportation on a prodigious scale. But there are huge deposits of iron ores remote

from fuels, yet relatively near regions of large potential demand for iron and steel and not far from waterfalls by which electricity could be generated cheaply. For years scientific men have been trying to produce iron directly from its ores by means of electricity.

There is another problem which concerns us all. Of the iron and steel produced by so great expenditure of energy, 20,000,000 tons are estimated to slip away each year by corrosion. Not only are expensive finished products lost, but the indirect costs are very great for temporary prevention, repairs and replacements. Cannot electricity help in producing, at reasonable cost, iron which will rust less rapidly or not at all?

Furthermore, discarded iron objects, from cans to automobile bodies, are increasingly disfiguring the countryside, especially in proximity to communities. Could not large tanks of iron solvent, ferrous chloride, for example, be maintained in convenient places, into which these wastes could be dumped? Then the iron could be recovered by electrolysis. Other aspirations also are entertained by forward-looking metallurgists.

Visionary? Generations away? Maybe not! And "where there is no vision, the people are perishing." They may not suspect danger, for the early steps of decadence are easy and pleasant.

But how far have the electrolytic iron men progressed? About fifty years ago, iron was produced electrolytically by Elihu Thompson and Edwin Rice but found so hard, rough and brittle that nothing was done with it. Since then many patents have been issued in France, the United States and other countries. A few years ago, the most successful concerns in France and the United States found that each had knowledge and patents that would be valuable to the other. They combined forces. In America the Niagara Electrolytic Iron Company has rehabilitated a chemical plant, recently purchased at Niagara Falls, and is commercially producing iron of a purity of 99.96 per cent, while continuing research and development. This iron is resistant to corrosion and has advantageous physical qualities.

The process begins with large bars of cast-iron, which, as anodes of huge batteries, are dissolved in the electrolyte of ferrous chloride. From this solution the current deposits the practically pure iron on the cathodes, which are long, thick, hollow steel cylinders with smooth surfaces. The cathodes are revolved slowly and the electrolyte is kept in constant circulation through the battery cells, or tanks. These cells are of reinforced concrete impregnated with 5 per cent, by weight, of sulphur.

On each cathode the electric current builds a seamless tube of iron ordinarily 9½ inches internal diameter and 13 feet long, of any thickness desired, up to ¼ of an inch. Diameter and length of tubes can be varied by using cathodes of different sizes. Thick-

ness depends upon time and current. The initial deposit is full of hydrogen, which embrittles the iron. Therefore, the cathode and the adhering tube, upon removal from the battery, are passed through an oil-fired annealing furnace, which removes most of the hydrogen.

For removal from the cathode a special stripping machine is used which enlarges slightly the diameter of the tube by kneading the iron between the cathode and three rolls which are forced against it by hydraulic pressure. Then the tube is returned to the battery. The electrolyte is regenerated in special tanks by aid of steel scrap and is used continuously.

By slitting, flattening and rolling, the tubes may be converted into plates of any desired thinness. Or the tubes may be slit into narrow strips or into coils for drawing into rods and wire.

Seamless tubes for steam boilers, condensers, evaporators and oil-racking stills, may be made to advantage from this iron; also containers for compressed gases, automobile mufflers, paper mill rolls, deep stampings and many other articles for which great purity, malleability, ductility, or resistance to corrosion are desired. And so by patient research, courageously supported by men of faith, the world is being enriched by a new group of industries with great possibilities.

Intercrystalline Cracks in Riveted Seams

Power, August 17.—The author maintains that intercrystalline cracks in boiler seams are fully explained by the action of prolonged high total stresses, and that high internal stress, when present, is due to unsuitable mechanical or thermal treatment of the material during manufacture or operation. The type of cracks under discussion is defined and it is shown that brittleness and intergranular weakness, due to improper treatment of the material, have been recognized as long as low carbon steel has been in general use. Observations from experimental work and investigations of failures within the last 30 years are cited.

FACTORS INFLUENCING BOILER FAILURE

In analyzing a failure, five items must be considered: (a) The composition of the metal; (b) the work done on it during manufacture of the plates and fabrication of the boiler; (c) the temperature to which the material has been subjected during fabrication and operation; (d) the effect of time, and (e) the feed water.

The crystal structure and composition of steel are discussed. The suggestion has been made to increase the carbon content of boiler steel. While low carbon steel is more ductile, it has a greater tendency to crystal growth, which weakens the steel. Increased carbon content will decrease the tendency to crystal growth and provide a safer steel. The manufacturers prefer a low carbon

steel, since it facilitates fabrication. Abnormally distributed "cementite" is often found in the steel when intercrystalline cracks occur.

If internal stresses are kept within reasonable limits, boiler material will stand such internal stresses plus the externally applied stresses without trouble. Of course, plates—and particularly those finished at low temperatures, and dished and flanged heads—should be annealed. Material injured by shearing and punching must be removed. Hammering of plate ends and the use of drift-pins must be avoided. The seams must be designed to remain tight when the boiler is subjected to the unavoidable variations in stress caused by the pressure and temperature changes of unusual boiler service. For this purpose it is necessary that the plates be laid up metal to metal and be tightly pressed together by the rivets. Otherwise, when the seam is loose, the plates slide over each other, and without friction between the plates to help transmit the load, the entire load is transmitted through the rivets, causing localized high stress at rivet holes. Excessive calking of a loose seam will not cure the original defect. On the contrary, it will only make it worse, since it causes bending stresses in the plates and opens the interstices between the plates farther.

The snapping off of rivet heads is ascribed to the bad effect of improperly heating the rivets, to vibrations during driving of rivets due to looseness in the joint and to deformation of the material at blue heat.

Effect of Temperature

If a metal structure is unequally heated, the cooler portions will be subjected to tensile stress and the hot portions to compression. The stresses may be sufficient to cause deformation and give rise to cracks within the structure. The appearance of fire cracks in boiler joints has been explained in this way.

The firing-up of boilers without proper water circulation causes great differences in temperature in the boiler structure. Particularly large deformations are produced in mud drums of inclined water-tube boilers, if cold water is trapped therein. No seam made up of thick plates should be exposed to flue gas. The effect of temperature in the development of crystal growth, which weakens the material considerably, is discussed.

The Effect of Time

Several workers have presented evidence that metals crack when subjected to prolonged or internal stresses for long periods of time without any chemical action, and the theory is upheld that the prolonged application of high stress causes a flow of the viscous intercrystalline cement resulting in intercrystalline cracks.

The Effect of Feed Water

This section of the paper presents evidence against the theory that caustic soda is the main and necessary cause of intercrystalline cracks in boiler seams. It is now recognized that in addition to caustic soda, heavy stress is necessary to cause the cracks, but, says the author, no definite line has been drawn indicating what the contributing effect of the caustic soda actually was in any practical case. It has been claimed that caustic soda will concentrate within seams, but there should be no interstices in a properly fitted seam, and no proof is forthcoming of the possibility of concentration in seams. Moreover, as long as hydrogen developed from the caustic soda is considered the embrittling element, the evidence proves that the production of hydrogen is not dependent upon the presence of caustic soda.

The author refers to the recent work of Parr and Straub but does not comment in detail on their statements, which had not been published at the time this paper was presented.

The author then refers to the list of failures submitted to the A.S.M.E. Boiler Code Committee, illustrating this phenomenon. He divides the failures into groups, corresponding to the various types of boilers used, and points out that the fractures occurred in definite places for each type of boiler at which the stresses may approach the breaking point.

Since caustic soda is present in 99 out of 100 boilers, and since many boiler waters contain little sulphate, it is easy to find cases of failure where caustic soda was present or where the ratio of sulphate to carbonate was small. However, cracks showing all the characteristics of so-called hydrogen embrittlement have developed in cases where caustic soda was absent, and also in places (outside of seams) where concentration beyond that of the boiler water cannot be assumed.

Conclusions

The more recent investigations which trace intercrystalline fractures in steam boilers to parts that have been overstressed, point away from the theory that the chemical action of caustic soda alone will cause the failures.

The author concludes that caustic soda is not necessary to explain the failures and in support of this cites failures of boilers, and other steel structures, such as shafting, bridges, etc., where caustic soda was absent.

Speaking to a meeting of boiler and pressure vessel inspectors, the author appealed to them to make thorough examination of each actual failure and to submit a full report. The activity of inspectors along these lines will not only supply the missing data from a statistical point of view, but will bring about co-operation of all those interested in improvements and thus enlarge our

understanding of the conditions that cause intercrystalline cracks in riveted seams.

Throughout the paper the author cited specific instances with numerous illustrations and extended quotations. The paper is an excellent summary of evidence supporting the fact that intercrystalline cracks are caused, in some cases at least, by prolonged or internal stress, with no chemical accelerating agents.

Weather Charts to Ships by Radio

Christian Science Monitor, 23 August.—Another step was taken the other day in the direction of making travel by sea even safer than it is at present when the experiments which have been conducted of late of transmitting weather maps by radio to ships at sea were declared a success. Indeed, during the past few days nearly a dozen weather charts furnished by the Weather Bureau at Washington, D. C., have been sent from the powerful naval station at Arlington, Virginia, and satisfactorily picked up by the bureau. It appears that the impulses emanating from the Virginia station were caught and interpreted by a special machine, which recorded by an ink stylus on a specially constructed drum the lines of the map and indicated all the regular data depicted on the usual daily charts.

Incidentally, the station at Arlington is of sufficient power to make contact with ships in all sections of the northern Atlantic, and it is announced that those in a position to speak authoritatively give it as their opinion that the experiments which have been conducted mean that it will not be long before the regular meteorological chart of the Washington bureau will be made available daily to ships therein. And these same officials believe that vast possibilities will open out before this field of marine weather forecasting. This is how the results expected have been outlined in one descriptive article concerning this new activity:

"It will enable ships at sea to receive exactly the same weather service as Uncle Sam now affords land stations, and officials have asserted that the ability to receive accurate daily weather maps showing the movement of storms, areas of high and low pressure, thermal lines and wind directions will be invaluable to meteorological investigators on naval and merchant vessels especially in time of impending disturbances."

All such methods of constructive advancement in the activities of human experience are to be welcomed. While the radio and other less refined methods of material invention are apparently extending mankind's dominion over the earth, they are in reality but indicating more or less crudely the fact of man's inherent dominion over all things earthly through a more comprehensive understanding of that divine power which enabled the humble Nazarene, the greatest of all truly scientific teachers, to do his mighty works.

AVIATION

The New Ford All-metal Monoplane

The Wright Engine Builder, August, 1926.—The new Ford all-metal monoplane, powered with three Wright Whirlwind engines, is now completing its official flight tests. It has been in the air a great deal in the last few weeks, and has been found satisfactory in every way. Both Henry and Edsel Ford witnessed the first test flight of the new plane, and a later flight was witnessed by representatives of the National Air Transport, the Colonial Airways, the Western Air Express and the Florida Airways. It is now ready for the start of the second annual commercial airplane reliability tour, which begins on August 7 in Detroit.

It is reported that the production facilities of the Stout Metal Airplane Division of the Ford Motor Company will hereafter be concentrated on the three-engine type, and that a production rate of one of these huge planes every week is intended. The National Air Transport, Incorporated, which operates the air mail and express line from Chicago to Dallas, Texas, is understood to be the first purchaser of a three-engined Ford plane. They are expected to start using it in August on a regular run out of Chicago. The Ford Motor Company are also expected to use these planes on their own airways. There seems to be no doubt that other important lines will place orders for this type of plane as soon as the Ford Motor Company is in a position to give regular deliveries.

The aeronautical public has been waiting a long time for the completion of the Whirlwind-engined Ford monoplane. It will be recalled that the first experimental three-engined plane was wiped out shortly after its initial flights by the fire which destroyed the Stout airplane factory last winter. But for this fire, many of these planes would be no doubt already in service. The Ford Motor Company's action in placing this model in regular production, and the widespread interest in this type of plane, will undoubtedly culminate in numerous orders.

The basic design of the plane follows the lines of other planes designed by Mr. William B. Stout, but the wings and fuselage are larger. The wings are of thick section and are braced internally. The fuselage is particularly well adapted for passenger carrying. It is so large that a man can stand comfortably inside. There is a central passenger compartment, with eight reclining swivel chairs, eight windows of generous size, and a large door. Interior doors lead to the forward compartment, high up in front of the wing, for the pilot and mechanic; and to the rear compartments for baggage and freight.

Safety is an outstanding feature of the plane. The pilot and mechanic, sitting just in front of the wing, have an unusually wide range of vision—an inestimable advantage in landing, and in

flying during bad weather or at night. The all-metal construction is rugged and durable. The landing gear is of the safety, split type, without any horizontal axle. It is provided with rubber-disc shock absorbers, and oleo recoil cylinders to prevent rebounding from the ground. All attachments to the fuselage are fitted with rubber shock-absorbing cushions. The wheels have large balloon tires, and brakes consisting of a V-shaped wedge, forced against V-shaped grooves in the rims by a control mechanism on the rudder bar. The plane flies well on any two of its three engines. In sum, every precaution has been taken to guarantee the safety and comfort of the passengers, both while they are in the air and while the plane is being landed.

A New Light Alloy

The Aeroplane, 4 August.—Some considerable time ago it was recorded in this paper that certain German aircraft constructors had begun to use a new light alloy known as Lautal, in place of the more familiar duralumin. Lautal is a patent proprietary alloy made by Eisen and Metall-industrie G.m.b.H., of Bonn on Rhine, Germany, who have granted rights in the alloy for the British Empire to Lavino (London), Ltd., of 48, Fenchurch Street, London.

Lautal is an Aluminum Copper Silicon Alloy (Copper 4%, Silicon 2%, remainder commercial Aluminium), with a specific gravity of about 2.75, which, when pressed or rolled and suitably heat-treated, possesses excellent mechanical properties. It differs from the more usual aluminium alloys of high strength in that it does not harden automatically at normal temperature after the annealing treatment. Consequently, Lautal can be purchased in the soft condition, kept in stock indefinitely, and worked to shape as required, and then hardened to the required degree. The usual "age" hardening alloys must be annealed immediately before working, and all the necessary bending, pressing, or drawing operations must be completed within a very short time of the metal's emergence from the annealing furnace or bath—which is often distinctly inconvenient, and sets a definite limit to the utility of these materials.

Lautal is produced in the form of sheets or strips, wires, rods, tubes, or other drawn sections, and as forgings. As the physical qualities of the alloy depend upon the extent to which the finished article has been worked—i.e., forged, pressed or rolled—from the original ingot, the strength and ductibility of the material depends on the thickness of section and the thinner sections are therefore invariably stronger than the thicker ones.

It is supplied in different states to suit the convenience of customers. These states, in the case of sheet, strip, or wire, are the normal, the unhardened, the soft annealed, and the hard drawn

or rolled. Any of these states may readily be converted to any other by heat treatment and working. Generally speaking, the unhardened state is recommended for general use. Heat treatment may be carried out in a salt, oil or air bath, depending on circumstances—the maximum temperature required being about 500°C. for annealing.

Normal quality sheet has a tensile strength of 24 to 27 tons per square inch (depending on thickness), a yield point of 13.7 to 17.14 tons with elongation of 18 per cent to 25 per cent and Brinnell hardness 90 to 100. In this state the material may be bent to radii of 2½ times thickness.

The unhardened quality has ultimate strength 19 to 22 tons, yield 10 to 11.5 tons, elongation 18 per cent to 25 per cent, Brinnell hardness No. 70 to 80. May be bent, rolled or drawn to radii of 1½ times thickness, and may then be given "Normal" physical qualities by heating for sixteen hours to 120° to 130°C.

Solt annealed Lautau has ultimate strength 14.6 tons, yield 4.6 tons, elongation 22 per cent to 28 per cent, and Brinnell hardness 50 to 55. In this state deep drawing or pressing is possible provided that the material is reannealed as soon as it becomes hardened at between 350°C. and 400°C.

Hard rolled or drawn sheet—which is produced only in thicknesses between .0117 and .117 inch—is very hard and brittle, and cannot be bent. The ultimate strength is 28.6 to 38 tons, yield 25.4 to 37.5 tons, elongation 15 per cent to 3 per cent, and Brinnell hardness 100 to 135. High strength and small elongation correspond to the thin sheets.

Rods, plates and forgings are produced in two qualities, A and B. A with an ultimate strength of 24 to 26.6 tons, a yield of 13.7 to 17 tons, and elongation 10 per cent to 18 per cent. Quality B has ultimate strength 21 to 24 tons, elongation 18 per cent to 25 per cent, and yield 12.7 to 15.87 tons. The difference between the two qualities is again a difference of heat treatment, quality A being produced by heating to a higher temperature for a longer period than for quality B. Lautal is forged at between 440° and 480°, and after working may be returned to A or B conditions by appropriate treatment.

Drawn sections and tubes are produced in qualities A and B corresponding to those described above.

Heat treatment for all of these forms of Lautal consists of annealing by heating to 490° to 510° and quenching in cold water. It is then hardened in an oil or air bath at temperatures varying from 120° to 150°C. for from 16 to 48 hours according to the ultimate strength required.

Lautal may be cut with normal metal-working tools with facility but must be kept at a temperature below 160° in the process. It may be ground and polished easily, can be soldered or welded,

though neither process is recommended. Rivetting must be carried out cold.

An alloy, known as L.IV, which is actually of the same composition as Lautal, is supplied for casting. Naturally it has not the strength of the worked material, but it compares favorably with other cast aluminium alloys, and can be improved by heat treatment after casting. Unheated sand castings give a tensile strength of 7.6 to 11.4 tons, and die castings of 10.2 to 12.7 tons. Heat treatment will increase these values by some 2½ to 5 per cent.

Complete instructions for the working of the material may be obtained from Lavino (London) Ltd., to whom also should be addressed inquiries for licences to manufacture Lautal.

The Curtis Duralumin Fuel Tank

Aviation, 9 August, 1926.—A new duralumin fuel tank, which combines the best features of brass and aluminum tanks, has been developed by the Curtiss Airplane and Motor Company, and is an interesting example of refinement in the art of aeronautical engineering to keep pace with the increasing demand for better performance.

The manufacture of fuel and oil tanks for aircraft presents many problems of weight, cost, and maintenance. The study that has been given to these problems by Curtiss engineers is an example of the careful attention to detail that is characteristic of the Curtiss organization.

MATERIALS FOR TANKS

Brass and terneplate were the first materials to be used extensively in the manufacture of aircraft tanks. The selection of these materials was probably due to the fact that both were readily obtainable and could be easily worked. Soldered joints were used in these tanks, and the finished product stood up well in service and was easy to repair in the field with an ordinary soldering iron. The one great disadvantage of tanks made of either brass or terneplate was their excessive weight and this item was of such importance that the designers sought other materials which might obviate this difficulty.

The next material to be used was aluminum, which, of course, is much lighter than brass or terneplate. Inability to solder aluminum satisfactorily forced the use of a welded construction on these tanks. This type of construction was extremely difficult and expensive, and the appearance of the finished product was not highly satisfactory. In addition, service difficulties developed; a sediment formed which interfered with the gasoline flow; leaks were frequent, and repairs in the field were difficult—in fact, almost impossible. In spite of these drawbacks, aluminum tanks have come to be extensively used in aircraft, solely because of their great weight advantage. It is interesting to note that prob-

ably the first aluminum tanks to be used in this country were those built by the Curtiss Company and installed in the NC boats, one of which, in 1919, made the first flight across the Atlantic, via the Azores.

Realizing that the ideal type of tank would be one which would combine the lightness of the aluminum type with the low cost and excellent service features of the brass tank, the Curtiss Company set about to develop such a tank, and, after a great deal of research and experimentation, has produced a duralumin tank. A special nickel-plating process, developed by William J. Travers, of Buffalo, New York, and of which Curtiss is the sole æronautical licensee, makes possible the soldering of duralumin, the strength and light weight of which are well known. Plated duralumin tanks, therefore, can be made by the same methods as brass tanks, which means ease and low cost of manufacture. They stand up well in service, develop no deposit to interfere with fuel flow, and, if damaged, can be repaired easily with an ordinary soldering iron. Combined with these advantages is the extremely low weight of the duralumin.

The importance of this weight saving can easily be seen when one realizes that on the Curtiss Hawk pursuit plane, a saving of about 45 pounds has been realized by making the gasoline and oil tanks of duralumin instead of brass, and this saving would, of course, be increased in larger machines. Since the weight carried by the Hawk is 6½ pounds per hp., the saving of 45 pounds means that 7 hp. has been released to do useful work in propelling the airplane.

Plated duralumin tanks have undergone all kinds of service tests for the past two years, and have shown up so satisfactorily that all tanks now being made by the Curtiss Company, including those for the U. S. Army and Navy Hawks and the Army Falcons, are of plated duralumin. These tanks are also being manufactured by the Curtiss Company for the trade.

Naval Aviation—Its Modern Mission

By Edward P. Warner, *Assistant Secretary of the Navy Aviation*, 2 August.—The duties of the new Assistant Secretary of the Navy who "shall, under the direction of the Secretary of the Navy, be charged with the supervision of naval aeronautics and the coordination of its activities with other governmental agencies" are not yet fully developed, but it is manifest from the present status of the aeronautical art and the present situation of aeronautics in the service that problems of procurement of equipment must be much to the fore. All other reasons aside, those problems would be thrown into bold relief by the establishment by Congress of a new legal basis for procedure just as new programs for continuity of production over a series of years are being planned. The new legislation frees the relations between the

department and the purveyor of aircraft and equipment of some of the restriction existing in the past, and it provides also for a certain coordination of governmental agencies in the consideration of design and invention. One specific function given to a board composed of the three new Assistant Secretaries in War, Commerce, and the Navy is the examination of patents and designs submitted for consideration and the passing of judgment upon their usefulness to the government.

It is well that there should have been legislation now aimed to clear up any defects inherent in the procurement methods formerly available, for the obsolescence and gradual retirement of war-time designs is putting the Navy's service equipment definitely on a post-war basis, where procurement of standardized types at a substantially constant rate can be organized without regard to the desirability of making use of large stores of serviceable machines and engines already accumulated. The problem of the transition period, extending over a number of years, from a war status in respect of equipment to a definitely post-war one has had to be faced by every service in every country.

Standardization of type itself becomes increasingly practicable with the passage of time, as increasing experience in the application of the principles of aeronautical engineering steadies the rate of development and makes it possible to plan for changes and modernization of types at comparatively regular intervals. Nowhere is standardization more necessary than in the Navy, where each group of vessels using aircraft must be a largely self-sustaining unit. Nowhere was it more difficult in the early stages after the war, when there were superimposed on the ordinary problems of design those of the adaptation of airplanes to service with the fleet, just then being started, since the anti-submarine operations during the war were carried out from shore bases. It, of course, continues true that the special needs of the fleet have always to be taken into account in selecting types of aircraft and in planning for their procurement. Some types are entirely special, with no counter-parts outside the naval service, and all are particular to that service in some degree. When landplanes are to be used problems of flotation gear, arresting gear, convertibility to seaplanes in a minimum time in case of need, and strengthening against catapult and arresting stresses have all to be reckoned with. They cannot be put aside, for there must be naval aviation to go with the fleet and base on the fleet wherever ships can navigate. The theory of a Navy as a group of movable forts defending the immediate coast line has held in some places and at some times, but it has no place in the United States and under modern conditions. The adaptation of aircraft to sea-going life and their constant improvement to guarantee their greater utility in all their functions of defense and offense at sea and in coast

defense offers the most fascinating opportunity for any one, officer or civilian, privileged to be associated with the work.

Possible Helium Compound

London *Times*, 11 August.—In the chemistry section this morning Mr. J. J. Manley described under the title of "The Union of Mercury and Helium" a series of experiments on which he has been engaged for the last six or seven years, which suggest that the inert gaseous element helium can be made to enter into chemical combination with mercury, forming a helide of probable molecular constitution HgHe.

After referring to the surprising nature of this result he said that his original experiment was designed to illustrate the perfect chemical inertness of helium, and it was only after trying it a number of times and in various ways that the conclusion was reluctantly accepted that a chemical compound of these two elements had been formed. The most recent experiments had confirmed that conclusion. Mr. Manley gave, first, an illustrated description of the experiment which led to the discovery, and, secondly, a short account of the latest experiments of a quantitative nature.

In the first a long barometric tube moving between rotatable guides, chemically cleaned and dried, was filled with purified mercury, and into the mercury was introduced a measured quantity of pure helium and the mixture subjected to an up and down movement imparted to the tube during internal electric glow discharge. After two hours a marked contraction was found to have taken place, and after several hours the pressure of the helium had fallen from seven to 1·8 millimeters, or 74 per cent. Similar experiments wth hydrogen, oxygen, and nitrogen during the glow discharge showed dense deposits of a permanent character, and he said he was inclined to think that in the moment just before the formation of compounds under such circumstances the chemical states were so abnormal that substances otherwise not obtainable were formed with ease.

In the elaborated apparatus for the quantitative determination of mercury helide Mr. Manley used three jackets of liquid air, a Sprengel tube, one or more synthesisers, a coil to give the electric discharges, an accumulator, a platinum spiral that could be maintained at white heat. In this apparatus the pressure of the helium introduced was gauged, the circulator was started, and synthesiser actuated by the coil. Almost immediately the pressure began to fall, but the helium was not found where he expected it. Then the heater (the white hot platinum coil) was started, and the gas pressure immediately returned to its original figure. In one of the tubes immersed in the liquid air there was a cluster of globules, and it was upon the ascertained weight of these that

the conclusion was based that a helide of mercury had been formed.

Minute Quantities

The weights dealt with were exceedingly small, of the order of 236 millionths of a gram. There were many difficulties in the accurate determination of so small a weight, but having satisfied himself by the methods adopted that his ascertainments were reliable, Mr. Manley said that the difference in the weight of the uncombined mercury before and after the experiment, and allowing for the decrease in the pressure of the helium gas, he found it possible to make a calculation of an empirical formula for the compound. This showed a molecule of one atom of mercury with ten atoms of helium, HgHe/O, which he found difficult to accept, and hence in need of further investigation.

Then followed a second type of apparatus and a new method, in which the helium and mercury were subjected to much longer contact with the glow discharge, and new figures were obtained leading to the assumption that the proper formula was HgHe—one atom of each element in the helide molecule. Mr. Manley said he had done his utmost to secure every possible help in getting accuracy in his work Professor Soddy, he said, had been greatly interested in his work, and had visited his experiments and had introduced a friend who suggested further experiments, including the measurement of an absorption band. He hoped shortly to be able to carry out these suggestions.

In the discussion it was suggested to Mr. Manley that the difference of result between his first and his second formula for the helide might be due to the mere absorption of helium by the platinum wire in the case in which the heated spiral was used.

Professor Thorpe, the president of the section, expressed the hope that next year at Leeds he would be able to complete the story.

New All-Metal Flying Boat

London *Times*, 20 August.—A new coastal flying-boat, the largest all-metal seagoing aircraft yet built in this country, was launched this week from the works of Short Brothers, on the Medway, at Rochester, and promises to mark a distinct advance in this type of coastal and long reconnaissance vessel.

The boat, with its white painted hull and wings, aroused much interest locally when it was brought out for its first brief flight. It is a large twin-engined flying-boat, with a biplane superstructure, in which the top planes overhang the shorter lower wings. The stern is swept well up above the waterline, and from the clean way it rose from the water the hull appears to be of low-water resistance. It has been built to the order of the Air Ministry, and has obviously considerable range and speed. Its

completion is a milestone in the progress of the firm of Short Brothers, whose aircraft history goes back to the pioneer days of 1908, as it marks the acceptance of the all-duralumin system of construction, for which Mr. Oswald Short has worked persistently since the end of the war. There has never been any question that the wooden hull was ultimately doomed for flying-boats, as water soakages of four or five hundred pounds in wooden hulls seriously diminish carrying capacity.

A duralumin hull built as a test some eighteen months ago has been exposed almost continuously to sea water at the Felixstowe Experimental Seaplane Station of the Air Ministry and has been reported upon most favorably. At the present time, in the workshops of Short Brothers, there is the duralumin hull and steel and duralumin wings of the Cockle, a small all-metal flying-boat which has also had some hard wear. This shows conclusively that there has been no deterioration in the hull, except at two places where the local reasons for the corrosion have been satisfactorily determined and where measures can easily be taken to prevent any recurrence. The duralumin ribs of the wings show no signs of deterioration at all, although the steel strip of the spars have rusted to a considerable extent in places.

A form of duralumin spar has now been evolved which is capable of being made in large sizes, and it is claimed that, owing to the greater ease in working a light alloy, it will be less expensive to build than a steel spar, while the greater thickness of the sheet gives it several advantages over the thinner section steel strip. A system of monocoque construction is used for all fuselage, and the strength of this particular form has lately received a convincing demonstration. The Short Satellite, a light airplane, which competed at the Lympone trials, made a forced landing and broke off its undercarriage in hitting a heap of rubbish. With an ordinary fuselage the whole of the nose would have been crumpled; the Satellite merely received a few dents. The same system of construction naturally has been applied to the large flying-boat. A high speed experimental tank has been of considerable service in designing clean hull shapes, and as a result of the experience gained here Short Brothers are now the chief designers and constructors of all-metal floats.

Other all-metal aircraft are in construction, and Great Britain may well lead the world in the all-metal construction of seagoing aircraft as a result of the independent work done at Rochester during the last few years.

MISCELLANEOUS

Naval Competition Persists

Christian Science Monitor, 14 August, 1926— Petersborough, England, August 14.—Professor Philip J. Noel Baker, Cassell professor of international relations at the University of London,

formerly member of the League of Nations Secretariat, who was associated with Lord Cecil from 1922 to 1924 on the temporary mixed commission studying the questions of land, naval and air disarmament, made the following comment on Rear Admiral Rodger's statement at Williamstown, Massachusetts, that the powers are unduly pressing on with warship building contrary to the intention of the conference, to the correspondent of the *Christian Science Monitor* here this afternoon:

"Broadly speaking, I think it is true to say that the Washington Conference for the Limitation of Armaments was a failure in that it has not stopped the very important and very dangerous competition between the great naval powers in respect of craft under 10,000 tons, particularly cruisers and submarines. In that sense the conference was a failure, and in my view no disarmament treaty can be really satisfactory which does not cover armament of all kinds and particularly, of course, ships of every category.

"On the other hand, there can be no charge of bad faith against the signatories on the ground that they have not observed the 5-5-3 ratio in respect of vessels other than capital ships and aircraft carriers which were the only two categories to which, under the treaty, the ratio was applied. Other categories were expressly excluded by the terms of the treaty which faithfully interpreted the whole negotiations at Washington.

"The third point, but most important, about the Washington conference is this, that it did actually stop a tremendously dangerous competition in capital ships and aircraft carriers between the United States, Japan, and Great Britain. That competition, which has been more intense than any naval competition in history, was rapidly leading Japan and the United States into a situation in which both parties were coming to regard war between them as inevitable. That situation was cleared away by the naval convention and by the four-power pact. The contribution to world peace thus made by the Washington Conference was of immense importance.

"But, of course, it was only a beginning, and if the events of 1914 are not to be renewed the remaining armament competition of which Admiral Rodgers speaks, and which is now going on must be dealt with by a new and comprehensive treaty.

"There is every reason to hope that such a treaty will result from the work of the preparatory disarmament commission now in session at Geneva."

Author of "Disarmament"

Professor Baker is author of a new book on *Disarmament,* published this week by the Hogarth Press. A review of the same in the current issue of *The New Statesman,* says. "It is by far the most comprehensive and clearly argued book we have

seen on the problem of disarmament. It discusses with admirable clearness what has been attempted, what is being, and what might be attempted. Mr. Baker, unlike some lesser apostles of peace, does not live entirely in the clouds.

"It is plain that, as Baker says, 'in Great Britain and even more in other highly developed countries, the reduction and limitation of armaments is an essential preliminary to substantial progress and reform.' Professor Baker reminds us that modern militarism dates from 1860, and declares that it should be 'relatively simple to go back to the standards and conceptions of two generations ago. . . . If the great powers of Europe can be but persuaded, the work is done.' But how is this task to be gone about? Great Britain should give a practical lead in persuasion, says Professor Baker.

"The British experts should prepare draft plans to lay before the League, all their technical knowledge and skill and information should be placed at its disposal and the British Government should make a generous offer of large reductions, especially of naval armaments . . . provided always, of course, that other powers will also cooperate and help."

Yes, but who will bring the British Government to this point? asks the *New Statesman,* adding in italics, *quis persuadebit ipsos persuasores?*

Naval Program Figures Do Not Confirm Charges

London, 14 August.—British Admiralty spokesmen decline to comment upon the allegation made at Williamstown, Massachusetts, by Rear Admiral Rodgers and others, that the view in naval circles here is that such statements, being unofficial, are best left unanswered.

In this connection a representative of the *Christian Science Monitor* learns that the naval building program, so far as figures are available here, do not confirm these charges. In the matter of cruisers it appears that Britain is building nine for itself and two for Australia, and has three more projected, while the United States has only eight upon the ways. This represents only part of the facts, however. The United States, for example, is building two aircraft carriers three times as big as cruisers, and at least as powerfully armed, while Britain has no such vessels either under construction or sanctioned.

The United States also has twelve destroyers sanctioned, whereas Britain is building only two.

In the matter of submarines, which are also important in this matter, Britain is building one for itself and two for Australia, and has six projected, while the United States has six authorized and one building.

The meaning of these figures is best understood when those for the other chief naval nations are placed alongside. There are,

for example, building or projected by France nine cruisers, thirty-three destroyers, and eighteen submarines, and by Japan eight cruisers, twenty-two destroyers, and thirteen submarines.

In other words, while the United States has building or projected thirty-nine war vessels of different kinds Britain has only twenty-five. Japan on the other hand, has forty-three and France sixty.

New York *Times,* 24 August.—London, August 23.—Since the Washington Disarmament Conference Great Britain has completed, started building or projected eighteen cruisers, ten submarines and two destroyers.

Four of the cruisers, laid down before the conference, have been completed since it was held. These are the *Emerald, Effingham* and the *Enterprise,* completed in 1925, and the *Frobisher,* completed in 1924.

Five more, the *Berwick, Cumberland, Suffolk, Cornwall,* and *Kent,* were laid down in 1924 and are scheduled to be completed in 1927.

In addition, four cruisers, to be named the *London, Devonshire, Shropshire,* and *Sussex,* are projected; also three as yet unnamed and two, the *Australia* and *Canberra,* are to be built for Australia.

Of the ten submarines mentioned above two, named respectively the *X-1* and the *L-27,* were completed in 1925, and two more, the *O-1* and the *L-26,* are scheduled for completion in 1926. Besides these six others are projected.

The two destroyers built since the Washington Conference are the *Amazon* of the *Thornycroft* type and the *Ambuscade* of the *Yarrow* type.

The net British naval estimates for the last three years are £60,500,000 for 1925-26, £55,800,000 for 1924-25 and £58,000,000 for 1923-24.

Favor Parley Here Eventually

British official circles make it quite clear that Britain is by no means averse to participating in another Washington Conference, but is inclined first to give a fair show to the preliminary Geneva disarmament meeting.

It is felt here that there will hardly be another regular conference this year or even next. "There is too much spade work to be done beforehand," is the way one official phrased it to the New York *Times* correspondent today.

It is acknowledged that Geneva is proceeding slowly, but the difficulties of clearing the ground for definite disarmament are fully recognized here.

In general, British officialdom is inclined to agree with Secretary Kellogg's views on disarmament, especially regarding the impossibility of gauging the potential war strength of nations.

Cruisers a Problem

One specific subject of naval disarmament, the crux of the whole question in British eyes, is the limitation of cruisers. It is pointed out here that Britain is very much nearer the European Continent than America, and hence much more concerned with naval strength and European continental actions.

Cruisers, it is pointed out, are essentially defensive weapons, especially useful for protecting the trade routes on which Britain depends for her life. These lie largely through the Mediterranean, hence Britain is much concerned with the naval strength of the Mediterranean powers, France and Italy.

She is *not* willing to agree to any limitations of British defensive naval units, namely, cruisers, unless the French and Italian offensive units, namely, submarines, are correspondingly limited.

Hence the question of cruiser limitation is much more difficult for Britain than the 5-5-3 ratio of battleship limitation which she accepted with the United States and Japan.

She limited her battleships, which are essentially offensive naval weapons, practically without taking into account the French and Italian battleship strength. But when it comes to limiting her cruiser strength, she must take into account the decidedly offensive naval strength of France and Italy as expressed in submarines.

French Program Extensive

By Edwin L. James, New York *Times*, Paris, 23 August.—Warships built or ordered by the French Government since the Washington Conference are provided for in the appropriation bills of 1922, 1923, 1924, 1925, and 1926.

The Budget Law of August 18, 1922, authorized the construction of three cruisers of 8,000 tons each, six destroyers of 2,400 tons, twelve torpedo boats of 1,460 tons; twelve submarines, six of 1,150 tons and six of 600 tons; also the transformation into an airplane carrier of the uncompleted battleship *Béarn*.

The Budget Law of June 30, 1923, authorizing nine submarines, three of 1,150 tons and six of 600 tons.

Since this date the influence of the Washington Treaty has entered into the making of the French naval program, and the appropriation bill voted on April 12, 1924, authorized two cruisers of 10,000 tons, six torpedo boats of 1,495 tons and two submarines of 1,560 tons.

The 1925 budget carried appropriations for one cruiser of 10,000 tons, three destroyers of 2,690 tons, four torpedo boats of 1,495 tons; nine submarines, seven of 1,560 tons and two mine-layers of 760 tons; one mine-sweeper and one aviation transport.

The 1926 budget authorized the construction of one cruiser of 10,000 tons, three destroyers of 2,700 tons, four torpedo boats of 1,500 tons, seven submarines, one submarine mother-ship, two naval tankers and one schoolship.

Of these ships ordered the 1922 lot has been about completed; the others are under construction.

The naval appropriations for the past four years have been 1,042,841,000 francs, 1,038,237,000 francs, 1,311,062,000 francs and 1,400,000,000 francs.

French naval experts estimate that in 1930 the active French navy, disregarding the existing battleships, which will be out of date by that time, will be composed of the following forces:

Four light cruisers of 10,000 tons, three light cruisers of 8,000 tons, six destroyers of 2,700 tons, six destroyers of 2,400 tons, twenty-six torpedo boats of approximately 1,500 tons, sixteen submarines of 1,560 tons, nine submarines of 1,150 tons and fourteen smaller submarines.

Japan Eager to End Navy Race

Tokio, 23 August.—Japan is particularly desirous of ending the naval construction race, realizing that the financing of a program to compete with America and Britain in naval expenditures is already a heavy burden.

Since the Washington Conference the Japanese have spent $355,000,000 for naval construction on three separate building programs. The total appropriation for the fiscal year 1923 was $91,000,000; for 1924, $89,000,000; 1925, $87,000,000; 1926, $88,000,000.

Since the Washington Conference Japan has built or is building: First-class cruisers, built two, building eight; second-class cruisers, built seven; aircraft carriers, built one, building one; torpedo mother ships, built one; first-class destroyers, built eleven, building nine; ordered four, projected twelve; second-class destroyers, built seven; submarines, built fifteen, building thirteen, projected thirteen; minesweepers, built four, projected two.

The navy is demanding that the next Diet shall sanction a quinquennial construction replacement program totaling $320,000,000, which plan for last year was cut to $26,000,000 for the four destroyers ordered.

Although it is several days since Secretary Kellogg's speech on disarmament, no vernacular newspapers have yet made any comment except the *Jiji*, which today says that the speech indicates dissatisfaction in the United States with Geneva.

Government spokesman, however, expresses approval of the speech, interpreting it as a feeler for calling a naval disarmament conference if the Geneva parley is not successful.

Though Japan is determined to try her best to make the Geneva Conference a success, official circles have never been very hopeful.

In the event of failure anything will be welcome which has a reasonable prospect of enabling the country to reduce naval expenditure.

Italy Against Navy Cut

Rome, 23 August.—Secretary Kellogg's speech, which has been universally interpreted as the first step toward convoking another naval disarmament conference in Washington, was received with a notable lack of enthusiasm in Italian official circles.

The feeling here is that the primary object of such a conference would be the limitation of cruisers, destroyers and submarines, and Italy is decidedly opposed to any attempt to limit these classes of war craft.

The foreign minister today officially refused to comment on Mr. Kellogg's speech on the plea that no decision had yet been taken on what attitude Italy would assume.

From conversation with several officials, including officials at the Ministry of Marine, it is obvious, however, that while Italy would naturally wish to participate in a conference where such important affairs would be discussed, she would resist any attempt to limit small craft; for Italy's opposition is based on the argument that cruisers, destroyers and submarines are the only types of war vessels which can be afforded by the poorer nations of the world; and she, therefore, sees in the attempt to limit them an effort to consolidate the present American-British naval supremacy.

According to these officials the limitation of small craft would also tend to perpetuate the present naval status quo among the nations.

Italy, on the contrary, feels that her present naval strength is inadequate as compared to that of other nations and may become even more inadequate in the future. She, therefore, is not willing to adhere to any agreement which might render the present relative naval strength of the nations of the world definite and unalterable.

In any case official circles here believe that steps toward convoking a naval disarmament conference in America are not imminent, as it will be necessary to wait for the discussion of the same subject in Geneva to be exhausted.

Opinion is expressed, however, that, though the probabilities of an agreement on disarmament being reached in America are greater than at Geneva, the success of a conference there is also very doubtful, as America and Britain are probably the only two nations which truly desire a limitation of cruisers, destroyers, and submarines.

Naval Programs

New York *Times,* 25 August.—Secretary Kellogg's announcement of August 18 that "the United States would be glad to cooperate with the other naval powers in extending the principles of the Washington Treaty to other classes of naval vessels," and his hope that "such a measure may soon be practicable," have not evoked enthusiasm in "the other naval powers." Such is the conclusion to be drawn from inquiries of correspondents of the New York *Times,* who, in reporting the building programs of Great Britain, Japan, France, and Italy, have sounded official opinion. Great Britain would be willing to participate in another Washington conference, but wants to see a fair trial of the preliminary meeting at Geneva. Faith in a second Washington Conference "this year or even next" is not very strong in London. "There is too much spade work to be done beforehand," the *Times* correspondent was told by an official. And then, as if to shed light on what spade work means, Great Britain's position is indicated. She does not warm to a set limitation of cruisers, because her trade routes "lie largely through the Mediterranean," and France and Italy, which are rivals in its waters, are not disposed to submit to a ratio affecting submarines.

Hitherto, Great Britain's objections have been reminders of necessary protection of her commerce in the Seven Seas. But now concern is mainly about the status in the Mediterranean, although Great Britain is in superior naval force there and is entrenched at Gibraltar and Malta. In *Brassey's Naval Annual* of 1925 the light cruiser strength of the British Empire in 1924, built and building, is put at fifty-four ships, that of the United States at twenty-eight (including "eight projected but not authorized"), of Japan twenty-three, of France fourteen and of Italy fourteen. A column of cruisers "built" in 1928 makes the figures, respectively, fifty-seven, twenty-four, twenty-eight, fourteen and fifteen, but it is noted that eight of the American cruisers were not authorized in September, 1924. It may be supposed that if something is not done about a ratio for cruisers, the eight American ships will be completed. At any rate, Great Britain is planning to keep far in the lead in cruisers.

Official France is giving out no inspired information about its attitude toward a second Washington Conference, but it is said that the navy list in 1930 will include four modern cruisers of 10,000 tons and three light cruisers of 8,000 tons, besides six destroyers, twenty-four torpedo boats and thirty-nine submarines. Secretary Kellogg's speech "was received with a notable lack of enthusiasm in Italian official circles." It is hinted that at another meeting in Washington, Italy would resist limitation of auxiliaries, regarding them as the only types of war vessels that a nation not rich can afford in quantity. A British service journal recently declared that an Italian battleship base in Sicily has been

determined on, and that "Rhodes is to be developed into a big naval base." "Italy," is said, "is entering upon a new era of naval expansion in the Mediterranean." If that is true, it casts a shadow over Italian limitation of armaments. Japan, staggering under the burden of large naval appropriations, would welcome a call to a conference in Washington if hopes are dashed at Geneva. Nevertheless, Japan is dedicated to an ambitious program, and her new cruisers, like the *Furutaka* and *Kako*, are formidable fighting machines. A government spokesman at Tokio commends Secretary Kellogg's speech, and interprets it as a feeler for a second Washington Conference if Geneva fails the powers. All seems to turn on the "spade work."

CURRENT NAVAL AND PROFESSIONAL PAPERS

Book of History—Of All Nations From the Earliest Times. 17 vols. Illustrated.

Industrial Leadership; a summary of some of the great post-war problems of Great Britain. S. S. Hammersley.

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In Retreat; a journal of the retreat of the 5th Army from St. Quentin, March, 1918. Herbert Read.

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The Lifeboat, Its Construction, Equipment and Management; a guide to the board of trade efficiency examination. H. S. Blake.

The Doldrums of the Atlantic. (British Air Ministry). C. S. Durst.

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China's New Nationalism and Other Essays. H. F. MacNair.

Putnam's Economic Atlas; a systematic survey of the world's trade, economic resources, and communications.

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Skyways; an interesting account by a pioneer of commercial aviation. A. J. Cobham.

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Essays on Nationalism; discussion of important factors in nationalistic feeling. C. J. H. Hayes.

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The Motor Ship; a reference book for 1926 containing a concise summary of motor shipbuilding up to the close of 1925.

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ARTICLES FROM NAUTICAL MAGAZINE, August, 1926.

"Nautical Words in Everyday Speech." A. A. Bestic.

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"A Submarine and Her Skipper"; some personal impressions and recollections. H. McMaster.

"Marine Patents." Patent Agent.

"Uniformity in Buoyage and Buoy Lighting."

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"Short Histories of British Wars." Maj. Gen. Sir G. Ashton.

"British Air Power."

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MAGAZINE ARTICLES

The Philippine Islands. *Review of Reviews,* August, 1926.

Some Facts About the Philippines. *Review of Reviews,* August, 1926.

The Myths of War. *Nineteenth Century,* July, 1926. Lt. Col. A. G. B. Smith.

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A Paper of the Highest Importance:

"Mr. Lloyd George's plan to win the war in 1915." *Atlantic,* July, 1926.

NOTES ON INTERNATIONAL AFFAIRS

FROM AUGUST 3 TO SEPTEMBER 3

PREPARED BY

PROFESSOR ALLAN WESTCOTT, U. S. NAVAL ACADEMY

UNITED STATES AND LATIN AMERICA

CONFLICT BETWEEN CHURCH AND STATE IN MEXICO.—The struggle between the state and the Catholic Church in Mexico, arising from the enforcement after July 31 of the religious clauses of the Mexican Constitution, continued through August. The most effective weapon employed by the church was an economic boycott affecting all purchases save absolute necessities. This was said to have cut down the sale of automobiles and luxuries by 90 per cent and to have caused the closing of many shops. Street fighting occurred between rival factions of deputies, in which several were killed and wounded. The taking of inventories of church property by civil authorities proceeded without interference. The government also (August 11) ordered the seizure of all property controlled by the Catholic clergy, valued at over $12,000,000.

Efforts at compromise apparently failed when on August 23 the Church refused to continue negotiations unless all regulations of the penal code affecting religion and the order for the registration of priests were suspended. Bishop Diaz, Secretary of the Episcopate, declared on August 26 that Catholics could accede to no proposal until the government attitude was changed and the constitutional clauses amended, and that they were prepared to wait months or even years for a satisfactory settlement.

In spite of complaints from American religious organizations, the view of the U. S. State Department was that no injury had been inflicted on American lives or property during the conflict thus far.

NICARAGUA PROTESTS MEXICAN INTERFERENCE, (From New York *Times* of August 28).—Geneva, August 27.—Mexico was denounced today to members of the League of Nations by the Nicaraguan Minister of Foreign Affairs, who charged an attempt with the aid of arms, munitions and troops of her regular army to overthrow the Nicaraguan Government. Mexico, according to the cablegram, received this afternoon by the Secretary General, Sir Eric Drummond, and immediately transmitted to all states which are members of the League, says in part:

"On the 17th instant the Mexican auxiliary warship *Concon* set sail from Salina Cruz on a free-booting expedition against the peace of Nicaragua. It was equipped, armed and manned, including military forces actually in service, by the Mexican Government for the purpose of assisting Nicaraguan revolutionaries who have so far failed, however, in attempts to overthrow the public order."

The cablegram is purely informative and denunciatory and requests no action by the League.

Unusual interest attaches to Nicaragua's protest inasmuch as it is the first Latin American controversy to come before the League, and the course the League will follow in a dispute on the American Continent is eagerly awaited.

The Nicaraguan Government likely will have something to say to the League Assembly, which meets ten days hence. If sufficiently heated the minister might go so far as to say the Monroe Doctrine permitted American battleships to protect American interests, but not to halt Mexican warships in an act violating international peace by aiding revolutionaries of a sister republic.

U. S. Protests on Mexican Oil and Land Laws, (From New York *Times,* August 7).—Washington, August 6.—A new note challenging the regulations issued under the recently enacted Mexican petroleum and alien land laws has been sent to the Mexican Government for delivery through Ambassador Sheffield. It is a long document taking up the issue where it was left off last spring, when only the land law regulations had been issued and the petroleum law regulations were yet to be promulgated.

The general position taken by the American Government in its communication is identical with the policy that has been observed throughout the long controversy in which it insisted that both the new laws—those dealing with American land and oil rights—failed to give full recognition to rights lawfully acquired prior to the adoption of the present Mexican constitution when Mexican law expressly provided that the owner of surface lands owned also the subsoil rights of petroleum, and permitted the legal acquisition also of land by aliens.

American officials were quite hopeful on April 1 that the new laws would be so carried out as to protect American interests without giving either law a retroactive or confiscatory application and that while the laws on their fact did not seem to American officials subject to interpretation as affording such protection the regulations issued under that legislation would do so.

Panama-American Treaty Terms.—According to *Time,* (August 7), the terms of the recently negotiated treaty between the United States and the Republic of Panama, not yet ratified by the U. S. Senate, are as follows:

(1) The northern area of Colon, including the Washington Hotel and the territory surrounding the Colon Hospital, the quarantine district and wireless stations, will be transferred to the United States.

(2) Panama will cooperate with the United States for the military protection of the Canal, and will consider herself in a state of war in any war in which the United States is a belligerent.

(3) A joint Panama-United States board will issue airplane flight licenses to United States and Panama aviators only.

(4) The Volstead Act will apply in the Canal Zone except as to liquor in transit, under seal, through the Zone or between two points within Panama.

(5) The Panama Government will operate the customs at the Canal Ports instead of the United States Government, as now.

FRANCE

CLEMENCEAU'S DEBT APPEAL TO PRESIDENT COOLIDGE.—M. Clemenceau, war premier of France, now eighty-five years old, on August 8 broke six years of silence in an open letter to President Coolidge. The letter argued that the debt of France to her former allies should not be considered as a purely business proposition, but that account should be taken of France's present financial straits, and her sacrifices of blood and treasure.

Since the letter was from a private citizen it was given no formal recognition by the United States Government. The administration indicated its attitude as being that the debt negotiations were now closed and the results subject to the action of our Senate and the French Parliament, the U. S. House having already approved. Commenting on the letter, Senator Borah suggested that "if European powers desired cancellation, there should be a general cancellation incuding indemnities from defeated powers."

POINCARÉ TRIUMPHS IN CHAMBER.—The success of the union ministry of M. Poincaré was signalized in early August by a decided rise in the value of the franc. The French parliament under strong pressure passed tax bills levying increased taxes chiefly on imports, rail, and motor transportation, foreign investments, and direct inheritances, and providing 2,500,000,000 francs increased revenue for this year and 9,000,000,000 for next. At a session of the National Assembly of the Senate and Chamber meeting together at Versailles, the French constitution was amended in order to make irrevocable the recent legislation providing for a 49 billion franc sinking fund, supervised by non-partisan experts outside parliamentary control, to take care of France's internal debt. The Parliament then adjourned.

FRANCO-GERMAN COMMERCIAL TREATY.—From *Current History* for September.)—After twenty months of negotiations signatures were affixed in Paris on August 5 to the Franco-German commercial treaty. Owing to certain questions not yet definitely settled the accord is for a six-month-period only, but is renewable by tacit understanding every half-year. The agreement replaces three modus vivendi adopted in April and September, 1925, and March, 1926, which covered only certain groups of the respective exports and imports of the two countries. The new accord covers almost the full range of trade between the two nations and was facilitated by a series of private agreements reached between the French and German iron and steel makers, in which several other nations were also participants. The treaty became effective on August 20. The text stipulates that its object is to prepare a definitive treaty and that a month after the French have enacted a new tariff law the delegations will meet again to discuss a permanent treaty. The treaty required ratification by the German Reichstag, but did not need the approval of the French Parliament. It was hailed as a step toward an economic Locarno.

SOUTHERN EUROPE

PANGALOS OUSTED IN GREECE.—On August 22 the Pangalos régime in Greece was overthrown by a bloodless revolution led by General Condylis and supported by the army and navy. General Condylis organized a temporary cabinet, pending elections promised for October. Admiral Condoriotis resumed the presidency. The London press declared the change meant a return of old Greek politicians into control. Greek currency took an upward turn, reflecting increased confidence in financial quarters.

General Pangalos attempted escape in a destroyer, but he was pursued, captured, and later imprisoned in Crete pending trial by a special court.

SPANISH-ITALIAN TREATY.—On August 9 it was announced that Italy and Spain had signed an arbitration treaty, cementing a rapprochement of the two Latin states which has been in process for some time. Although the exact terms of the treaty were not to be given out until after its registration with the league, its provisions and significance were thus stated in *Time* of August 15: What are the terms of this avowedly secret treaty? The signatory powers contented themselves with a cryptic announcement: "The treaty will be made public when it is registered with the League of Nations," an event which may perhaps be delayed indefinitely.

From "inspired statements" in the Hispano-Italian press, it became clear that the instrument consists of some fifteen articles,

dealing with the relations of Italy and Spain, firstly from a political and secondarily from a juridical aspect:

(1) Neutrality on the part of one signatory power is provided in the event of the other signatory being attacked without provocation by a third power.

(2) A commission of five members (one Spaniard, one Italian, and three neutrals acceptable to them) will be constituted to arbitrate questions arising between the signatories.

The nice interbalance of the Northern Mediterranean powers and their incessant rivalries for possession of Southern Mediterranean lands renders the present treaty of paramount importance. France and Spain have just victoriously concluded a war which has given them control of Morocco and when a partition of this territory is made Italy will assumedly claim a share. Thus, in respect to Morocco alone, the new treaty looms ominously for France. Dictator-Premier Primo de Rivera of Spain went so far as to intimate to correspondents last week that Spain will demand for herself the now Franco-Anglo-Spanish-neutralized Zone of Tangier, Morocco.

Speculating further afield last week, a handful of alarmists prophesied that the treaty will mark the inception of a concerted Hispano-Italian program of "peaceful penetration" into South America through emigrant organizations and propaganda which may eventually threaten the Monroe Doctrine.

DISPUTE OVER TANGIER.—In the latter part of August Spain addressed to the powers concerned in the Treaty of Algeciras (except Germany, Austria, and Russia) a memorandum declaring that control of Tangier by Spain was necessary in order to prevent its use as a center for arms smuggling and plots against Spanish authority in Morocco. The document added that if necessary an appeal would be made to the League of Nations for a mandate over the Tangier town and district.

It was assumed that the British attitude toward this claim would be continued opposition to control of Tangier by any one nation, in view of its possible value as a counterweight to Gibraltar. In France the view was taken that the League was in no way concerned, since technically the decision rested with the Sultan of Morocco, under French protection. French authorities however were willing to give Spain control of the Tangier police, now under Belgian direction. Italy expressed a desire to be included in the control of Tangier on the same terms as France, Great Britain, and Spain.

It was believed that the Spanish demand was advanced at this time in the hope that it might be granted as the price of Spanish consent to the admission of Germany to the League Council in September.

RUSSIA AND EASTERN EUROPE

SOVIETS SWINGING FROM RADICALISM (From New York *Times,* August 18).—Warsaw, August 17.—A definite drift to the right in Russia, with the Stalin Government holding steady while the old revolutionaries are gradually being forced into the background, was pictured by M. Ketrzynski, the Polish Minister at Moscow, upon his arrival here yesterday.

He declared that the movements led by the old leaders, such as Trotzky and Zinovieff, are headed for oblivion, and that new and notably young leaders are replacing the old figures who revered Lenin and his revolutionary gospel.

He also stated that there is a strong anti-Jewish feeling growing and that anti-Semitic rioting may be expected momentarily.

In the move to the Right, Zinovieff's chief complaint was that the present governing groups have ceased to maintain a real world revolutionary spirit, have lost their fighting inclinations and are coming more to a policy of maintaining a pure Russian state policy, which means the abandonment of communist conquests abroad.

The upshot of the recent disturbances, which so far have not resulted in an open struggle, is a distinct drift to the Right, in which foreign relations will be considered in connection with an all-Russian policy, according to M. Ketrzynski.

The report of the envoy is related closely, in the opinion of observers here, to Poland's foreign program at Geneva in September, in which it is hoped to show that a refusal of a seat on the council will force Poland to a reapproachment with the Soviet states.

TREATY BETWEEN POLAND AND JUGOSLAVIA (From New York *Times,* August 20).—Belgrade, August 19.—Jugoslavia and Poland, to strengthen the good relations between them, have agreed upon the text of a treaty of friendship and arbitration in conformity with the terms of the Covenant of the League of Nations. The treaty will be signed in Geneva next month.

The conclusion of this treaty at a time when the composition of the League Council is under discussion indicates that all the friends of France are being mobilized on behalf of the Polish claim.

In return for this it is intended that Jugoslavia should have a greater body of support in the council, if any future dispute with Bulgaria is referred for settlement to the League.

LEAGUE OF NATIONS

CONFERENCE ON AMERICAN WORLD COURT RESERVATIONS.—Up to August 22, eighteen nations had accepted the invitation of the League Council to a conference at Geneva on September 1 to discuss the reservations submitted by the United States as condi-

tions of its participation in the Permanent Court of International Justice. Of the five reservations, the fifth, objecting to advisory opinions by the Court on subjects in which the United States was concerned, was expected to give the most difficulty.

REORGANIZATION OF COUNCIL SEATS.—The final session of the Committee on Reorganization of the League Council was held on August 30, preliminary to the sessions of the League Council and Assembly in September. Previous to this meeting, a plan was devised by experts which provided semi-permanent five-year seats in the council for both Spain and Poland. Only Germany however was to be given a permanent seat.

WORK OF ARMS COMMITTEE.—The preparatory committee for the Disarmament Committee took up in August the preparation of its report for submission to the League Council. Much difficulty arose over the answer to question 4 regarding defensive armament. The preamble as finally adopted read as follows: "Generally speaking, any component elements of armaments which are incapable of mobility by means of self-contained power, or can only be transported after long delay, and are erected within the home territory of a country, can only be used for the defense of that territory."

The most important of these component elements named by the drafting committee and adopted unanimously by the commission are:

"First, fixed defenses including shelters and obstacles, excluding armament and transportable equipment—fixed installations for observation and signalling and communications of all kinds such as are buried, and submarine cables, lookout stations, narrow guage railways boom defenses.

"Second, mobile defenses, including vessels of small sea-going efficiency and low power endurance, capable of use only within a strictly limited distance along the national coast line. In this case proximity to the coast of another state, or to an important commercial trade route, would confer on such craft, despite their limited radius, activity of high offense value.

"Third, defense against air attacks including fixed anti-aircraft gun emplacements—fixed searchlight emplacements—balloon screens—listening and observation posts—camouflaged installations."

There are expressly excluded from defensive armament:

"Organizations the principal purpose of which is obviously to enable long range artillery or an air attack to be brought to bear on the communications of a neighboring country or its exposed points near the frontier, and which are not indisputably justified by the necessity of protecting especially exposed points in the

country concerned, and naval or air bases, the principal object of which is not to defend the territory or vital communications of the state to which they belong, but either to cover the assembling of supplies, materials for repairs, etc., in order to extend the striking range of naval or air forces, or to command for the benefit of a single country certain routes used by international seaborne trade."

The last clause was proposed by the French as a slap against British control of the seas, and it was accepted by the British without a murmur.

OBJECTIONS TO ARMS CONTROL BODY.—Geneva, Aug. 19.—The United States, Great Britain, Japan, Italy, Chile and Sweden today introduced a minority report on the question of international control of armaments, declaring the proposed Board of Supervision would be a kind of international general staff, the creation of which would be open to serious objections.

This action was taken after a majority of the Military Disarmament Commission, which is preparing for a disarmament conference, had advocated the organization of a permanent body for the collection and dissemination of armament information with the prerogative of ruling as to whether armaments showed an aggressive or defensive tendency.

The dissenting nations declared that it would be extremely difficult for the commission to reach unanimous reports and that the members would be influenced by divergent political considerations which were bound to hamper an impartial inquiry.

Furthermore, it was believed that inquiries on the spot where a decision might be taken were certain to lead to unfortunate political results.

It was also deemed impossible that one country might bring a charge against another for the purpose of obtaining information about secret defensive organizations of the country accused.

In conclusion the report says that the introduction of restrictions upon the sovereign rights of states tends to militate against the creation of an atmosphere of good faith among nations.

FAR EAST

UNITED STATES OBJECTS TO NEW CHINESE LOAN.—In a note published August 23 the United States protested to China against the projected issue of a new domestic loan of 25,000,000 dollars silver, to be secured by customs revenues available next year. The note called attention to long-standing debts due to Americans, amounting to about $36,000,000, which were entitled to payment before new debts were incurred. In view of the present weakness of the Peking government, the note served merely to put the American position on record. Considering that the consortium, formed to supervise the lending of money to China, was called

at the invitation of the United States government, that government had special reason to be concerned in China's present financial plans.

CHINA THREATENS TO END TREATIES.—In August it was reported that the Chinese minister at Rome had announced at Geneva the intention of the Chinese government to abrogate its commercial and extraterritoriality treaty with Belgium, effective October 29. The authority of the minister was questioned. However, his announcement suggested the possible purpose of China to renounce all treaties with western powers.

RETREAT OF NATIONAL ARMIES.—During August the Knominchun or so-called "National Army", which had been threatening Peking from the Nankow Pass, retreated toward Kalgan, 116 miles northwest of Peking, before the army of Chang-tso Lin. General Wu Pei-fu's forces were not active in this campaign, and it was reported that his army had suffered reverses in the fighting with Cantonese troops in the south.

JAPANESE-AMERICAN RELATIONS DISCUSSED AT WILLIAMSTOWN.—During the session of the Institute of Politics at Williamstown in August, there were several speeches and round table discussions relating to political problems of the Pacific and Far East. Admiral Pratt, speaking on August 23, pointed to influences in the Far East which create the possibility of war. Except Russia, declared the Admiral, the great powers would wish to limit such a conflict, if it occurred, to minor proportions, whereas the Soviet Government would seek to involve all nations.

Summarizing the discussions in Japan, Professor Blakeslee, who was chairman of the round table, maintained that peace between Japan and the United States was apparently assured by the following four-fold guarantees:

"The diplomatic guarantee: No important clash of material interest or of policy now exists between the United States and Japan;

"The economic guarantee: One of the foundations of the present economic structure of Japan is its great export of raw silk to the United States;

"The military guarantee: In view of the uncertain situation in Manchuria and the apprehension felt by military men in Japan regarding future developments with Russia, it would be military madness for Japan to permit even strained relations with its powerful neighbor at its back door;

"The political guarantee: The responsible political leaders of both the United States and Japan are obviously determined to preserve unbroken friendship between the two countries."

In conclusion he described a necessity for healing the wounds caused by the Japanese exclusion measure, if the Japanese immigration question is to be regarded as definitely settled.

RUSSIAN MENACE IN MANCHURIA.—Williamstown, Massachusetts, August 16.—Manchuria as a danger zone to China and the Far East caused a lively discussion at the Institute of Politics today. Among the speakers were Henry K. Norton, writer on Far Eastern affairs, and Nicholas Roosevelt of the editorial staff of the New York *Times,* who recently returned from the Far East.

Mr. Norton declared that the Russian drive toward the Pacific is just as insistent as the Japanese contention that Russia should not have a port or naval base south of Vladisvostok, and that only a strong China would be able to hold Japan and Russia outside her territory and put an end to danger in Manchuria. Until such a China is established the restraining influence of the other powers is absolutely necessary to preserve peace, he said.

Mr. Roosevelt recounted some of his observations in Manchuria. Referring to the rivalry of Russia and Japan in China, he asserted that the present policy of Russia in China, especially in North China, is not only a revival of the policy of Czarist Russia, but that the Soviet Government "went Czarism one better."

Soviet Russia, he said, not only has tried to assure its own rights in Northern Manchuria, but has tried to dislodge the other foreign powers from China, the principal method being propaganda to stimulate the anti-foreign agitation in China.

Both speakers agreed that the new Japanese railways in Manchuria, while ostensibly economic and commercial, could in time of war easily be utilized to cut the Chinese Eastern Railway and isolate Vladisvostok and the maritime provinces. It was indicated that Russia is contemplating the building of a road through Mongolia and Northern China toward Peking, with Shantung as an outlet to the sea.

A strong China might take over the network of new railways, thank Japan and Russia for building them and then invite them to leave her territory.

While Russia, through its renunciation of extraterritoriality and the Boxer indemnity, had again become a leading factor in Peking, with no other weapons than "propaganda and bluffing," Mr. Roosevelt said the Bolsheviki made a mistake in thinking they could stir up anti-foreign propaganda and escape from the results of the agitation. In the end Russian prestige in China collapsed.

"My impression of the present policy of Russia in China, especially Northern China," declared Mr. Roosevelt, "is that it not only revived the policy of Czarist Russia but that it has gone that policy one better."

ECONOMIC DEPENDENCE OF JAPAN.—(From New York *Times,* August 7).—Williamstown, Massachusetts, August 6.—Speakers at the Institute of Politics today declared that the close commercial ties between Japan and the United States, their joint interest in the fostering of trade relations with China, and particularly Japan's dependence on the American market, made war between the two nations extremely remote.

It was pointed out that the basis of Japan's foreign policy was a pressing need for the cultivation of markets abroad. For Japan to lose a single foreign market, especially that of the United States, would be ruinous. It was asserted that the diminution of influence of the military party in Japan was a healthy sign pointing in the direction of the strengthening of civilian influence.

Among the speakers was F. R. Eldridge, Chief of the Far Eastern Division of the United States Department of Commerce. Mr. Eldridge discussed Japan's growing dependence on foreign markets for her food supplies and raw materials, and indicated that Japan's foreign policy was a direct outcome of her dependent economic condition. The recent industrial development of China, he said, coincided with the increase in the capacity of the American market to absorb Japan's silk. The result has been that nine-tenths of the nation's raw silk, which is 42 per cent of Japan's exports, comes to the United States.

"Japan today finds herself in a singularly weak economic position despite a marvelous industrial growth," Mr. Eldridge said. "With a population growing at the estimated rate of 1 per cent a year, these additional 750,000 new Japanese subjects are being fed on an ever increasing ratio of imported foodstuffs.

"Japan, moreover, is singularly deficient in raw materials and must depend upon India, the United States and China for almost all her raw cotton, upon Australia for wool, upon China for hides and upon British Malaysia and the Dutch East Indies for rubber and sugar. Under such circumstances Japan is not only constantly menaced by this dependence upon foreign sources of raw materials but in all other exports except raw silk, her foreign markets are constantly subject to local industrial development such as threatened to remove China from her list of best customers."

"Japan presents the anomaly of rapid industrial growth coupled with an increasingly difficult economic position. Her very economic existence depends upon a still more diligent pursuit of the same policies of economy at home and the still wider cultivation of markets abroad that has characterized the last few years of her economic history. That these economic facts are the basis of Japan's foreign policy, any one familiar with the trend of that policy in recent years cannot deny. The loss of any single important foreign market which now bolsters up Japan's economic framework would be sufficient to throw the whole finely balanced structure into a singularly precarious position."

BOOK REVIEWS

BOOK DEPARTMENT

The Institute Book Department will supply any obtainable naval, professional, or scientific book at retail price, postage prepaid. The trouble saved the purchaser through having one source of supply of all books should be considered. The cost will not be greater and sometimes less than when obtained direct from dealers.

Address all communications to: Secretary-Treasurer, U. S. Naval Institute, Annapolis, Md.

AIRCRAFT AND COMMERCE IN WAR. By J. M. Spaight. Longmans, Green and Company, New York. $2.25.

REVIEWED by CAPTAIN (Retired) D. W. KNOX, U. S. NAVY

Aircraft and Commerce in War, by J. M. Spaight, is mainly an argument in support of full development and perfection of a system of economic starvation of an enemy through trading agreements made between a belligerent government and private mercantile businesses in neutral countries. By this means the physical difficulties and political dangers incident to blockade enforcement by the stronger sea power against neutral commerce are expected to be greatly minimized.

Unquestionably the World War demonstrated both the practicability and the merit of this device. The great problem of the blockade *against Germany* and *Austria* was not the stoppage of shipments direct to their ports, either in their own or neutral ships. That was easily prevented on any great scale. But it was quite another matter to provide against a complete nullification of the objects of the blockade through huge shipments from overseas neutrals into other neutral countries closely adjacent to the blockaded belligerents. Such shipments or their equivalents were certain to find their way into *Germany* and *Austria.* The complex structure of international law relating to blockade, contraband, ultimate destination, prize courts, etc., was subject to a variety of interpretation, irksome delays, and heated differences of opinion. Not only was it virtually impossible through the agencies of the blockade and international law, to keep great quantities of essential supplies from reaching the Central Powers, but also the attempt to do so involved highly dangerous political friction with neutrals. In this dilemma the British Government adopted the expedient of trading agreements with various neutral private interests: "With the meat packing interests, the rubber interests, the shipping lines, exporters, importers, the trusts, associations, chambers of trade, merchant's guilds," etc. "The quiet business

men who, sitting in their offices, sealed the contracts restrictive of every kind of trade which could benefit the Central Empires, did something more than they seemed to do. They sealed the fate of those Empires themselves. . . . It was not the tragedy of the cargoes captured on the high seas that Germany had to bewail. It was the tragedy of the cargoes which were never shipped at all."

The potency of this economic device of war is apparent. In the late conflict this system was "an improvisation, an innovation, an experiment, largely a make-shift, never thought out as a whole and completely organized, imperfect in many ways, yet unquestionably a practical success. What it accomplished in the Great War is chiefly important as showing what it should be able to accomplish when fully developed and perfected."

Manifestly such a system could be adopted with much success only by a belligerent whose control of the sea is practically certain. None other would have the necessary bargaining advantages, such as assurances of freedom from costly delays, safety in transit, use of fuel stations and port facilities, etc., with which to persuade neutral shippers to sign up the agreements.

This aspect of the matter is touched on lightly by the author. He sees the essential need of control of the oceans in order that his main theme of economic war through trade agreements may be sustained. Yet paradoxically he throws stones at the "old school" of professional thought which still frames war "in terms of the encounter of armed forces and of orthodox military operations." In this slant he adheres to conceptions of making war without fighting which seems to have become prevalent of late among civilian writers, especially in Great Britain. The fault they find with the military and naval profession for failing to appreciate the importance of those aspects of war which are not closely related to fighting, can scarcely be justified on any large scale among officers of rank. On the other hand the civilians seem to write with scant understanding of the fundamental dependence of the semi-pacific measures which they advocate as a substitute for battle, upon the influence and intelligent use of efficient armed forces. The doctrine of avoiding decisive battle, more than anything else, was responsible for the British failure to annihilate the Germans at Jutland. Had this been accomplished the semi-pacific measures which become practicable and effective after decisive victory, could then have been employed at sea by the Allies, with a probability of saving Russia from revolution, wholly preventing the submarine campaign, saving many thousands of lives ashore, and winning the war in 1917. The system of trade agreements might well have been unnecessary, had the high seas fleet been destroyed, yet no such system could ever have prevented Jutland. Rather would it, or its equivalent in an effective blockade, have made a Jutland more certain. Armed

forces, prepared to fight when the occasion demands, and semi-pacific measures are not rivals, but handmaidens, in the proper conduct of war.

As Mr. Spaight's title indicates the development of aircraft is an important factor in his premises and conclusions. He seems sound in assuming a great aerial evolution afloat. The ship-based plane is an instrument which will greatly simplify the problem of making a blockade really effective. Yet at the same time it will heighten the difficulties of preserving good relations with neutrals, and hence increase the danger of forcing them into the war on the wrong side.

From their nature aircraft will rarely be able to "visit and search" merchant vessels on the high seas. Therefore, even in commerce between two neutral countries, "vessels will be diverted for examination to a greater extent than formerly. They will be ordered by belligerent aircraft to proceed to this or that port for search. If they disobey or resist they will be liable to be bombed or torpedoed. Grave international incidents may be created by the sinking of neutral ships. The position of neutral commerce will be deplorable."

The author justly maintains that sea and air power, working together, can close the seas to an enemy as they have never been closed before. To base such closure on the obscurities and complexities of international law would bring the whole neutral world to arms for the freedom of the seas. To base it on "contract" would short circuit these difficulties. "Sea power *plus* air power *plus* special agreement: that is the secret of workable and irresistible economic pressure."

The moral is drawn that Great Britain must be sure to build up air power and maintain sea power sufficient to insure the proper working of the contract system, since, as will be recalled, superiority in these respects was a major premise of the general theme. That such a moral is equally applicable to other nations is not stated.

On the whole the book is well thought out, well written, and well worth reading by both the professional man and the layman.

FIX BAYONETS! By John W. Thomason, Jr., Captain, U. S. Marine Corps. Charles Scribner's Sons, New York, 250 pages. $3.50.

REVIEWED BY BRIGADIER GENERAL DION WILLIAMS, U. S. MARINE CORPS

Fix Bayonets tells five gripping stories of the American marines in the World War. These stories first appeared in the monthly editions of *Scribner's Magazine* and they were so well received by the reading public both in and out of the government services that the publishers have issued them in book form as a permanent record of the life and deeds of the marines

in the great adventure when America sent her best to the aid of the allied forces sorely pressed by the Germans on the west front in France.

The author, Captain John W. Thomason, Jr., U. S. Marine Corps, enlisted in the marines at the entrance of this country into the World War and was soon advanced to commissioned rank. He was sent to France with the fifth regiment of marines which formed a part of the first expeditionary force to carry our colors to French soil and served through all of the campaigns of that gallant regiment, and the subsequent occupation of German territory.

Before entering the marine corps Captain Thomason had been interested in artistic pursuits and his studies in this field had developed a natural talent to such an extent that he had become an artist of no mean ability. During the marches, and in camps and battles in France he saw the scenes about him with the artist's eye and occupied some of his time in the trenches and billets and during the rests on the march in making sketches of many varied incidents that came under his notice. These drawings showed the troops on the march, in camps and billets, and on the firing line, and they form a graphic record of the marine in active service, humorous, sad, tragic, and amusing, but always life-like.

Seeking for the publication of some of these drawings Captain Thomason was advised to prepare appropriate stories to accompany them. Following this good counsel, he produced the first of his stories, "Fix Bayonets," to be followed later by, "The Charge at Soissons," "Marines at Blanc Mont," "Monkey Meat," and "The Rhine."

From his own experience in the ranks and from his close association with the men of his company and battalion in the intimate life that war enforces, he knew his subject thoroughly and the results show that he also has the rare power of putting into the printed story a vivid and almost living story of the results of his keen observation.

The whole book is a series of views of the marine in action and on the march and at rest when tired bodies could no longer "carry on" without some refreshment. Many of the incidents are so evidently true accounts of actual happenings, and many of the characters are so plainly the comrades who served under and with him, that it is quite common to hear veterans of the war when reading the stories remark, "That's no story, that's the truth, I was right there when it happened," or, "That was Bill Brown himself and I guess the other fellow was me."

In the introduction to his book, under the title of, "The Leathernecks," the author has given an interesting account of the origin of that famous saying, "Tell it to the marines," and of how the marines at the very start of America's effort in the war were assembled from barracks in home yards, fighting ships of the

Navy on the high seas, and tropical isles, and were quickly welded into the fifth and sixth regiments of marines. This became the fourth brigade that as a part of the Second Division of the A.E.F. lived up to every good tradition of the service and made the motto of the corps, *Semper Fidelis,* a living symbol of devotion to duty and to country and of efficient performance of the tasks presented from day to day in a war of major effort.

There are many books on subjects connected with the World War, histories of divisions and regiments, tomes of dry official reports containing material for future research and study at war colleges and in general staff deliberations, books of fiction based upon incidents in the life of the writers or upon the stories that participants have brought back to their home towns from the Big Parade; but none that I have seen is so replete with human interest, so evidently true to the life of the officer and enlisted man as he lived it at the front, and so blended with humor, pathos, and tragedy as this collection of stories of the American marine in the World War.

To the soldier and the sailor the book will be of interest as a portrayal of the life of his brother in arms and to the civilian it will be a revelation of the thoughts and actions of the young Americans who went to the front in 1917 and enabled Pershing to say, "Lafayette, we are here."

THE DARDANELLES EXPEDITION. By Captain W. D. Puleston. U. S. Navy. U. S. Naval Institute. $2.50.

REVIEWED BY REAR ADMIRAL W. V. PRATT, U. S. Navy

In his work *The Dardanelles Expedition,* a condensed study, Captain Puleston, U. S. Navy, has made a valuable contribution to the history of the late war. While not a book to attract the lay reader, as incidents which arouse the human interest are absent, for the student, and particularly for the naval student, the book has value, especially as the writer has been at pains to eliminate the mass of military detail, so that only the essentials remain. Coupled with the extensive use of plates to illustrate the operations undertaken, this method of treatment gives the reader a fairly comprehensive idea of the land and sea campaign undertaken for the purpose of striking a blow at Turkey in the vicinity of Constantinople.

Captain Puleston has rightly spoken of it as an expedition. This is what it amounted to, though the political and strategic interest underlying the expedition was such that it should have been dignified from the start, if it were to be undertaken at all, with the status of a campaign and, as such, adequate preparations made with sufficient force assigned to make of the campaign a success. In the end over 400,000 British troops had been involved and about two divisions of French troops, not to mention the many naval units which took part in all the varying phases

of the expedition. But the inception of this expedition took the character of a raid and not a major campaign, in which naval forces alone were to be used to operate against land batteries in an attempt to force the Dardanelles, gain control of the Sea of Marmora, effect a junction with the Russian Black Sea fleet, cut Turkey in two and lay pressure upon its capital, Constantinople. A worthy project certainly, if practicable, but one not to be conceived as a raid but as an operation of major importance involving the use of both land and sea forces, in joint operations. In the end it did turn out to be a campaign of magnitude involving nearly one million men, but it was not conceived in this vein, and preliminary thought and preparation were not made.

The book really divides itself into four sections though no such division is made by the author. The first section deals with the political and strategic background; the second section deals with the naval phases of the operation; the third section deals with the military phases, in which the Navy merely supported; the fourth section deals with conclusions.

The third phase, that of military operations is too complicated for the naval man to understand thoroughly unless he can make a more intensive study than is possible from this book. However, the detail is sufficient and the plates ample to give the reader a comprehension of the general plan and purpose.

The real interest to the naval man lies in sections one, two, and four, as the reviewer of this book chooses to divide it. The historical and strategic review is sufficient to form a background for the details of the picture. Section two dealing with the naval operations is valuable. The operations themselves were carried out with thoroughness and efficiency, yet in the end naval force alone was not able to accomplish the purpose, and it is doubtful if naval force alone will ever prevail against land force on land. Granted that in later wars the character of over-seas expeditions will be influenced by the presence of air forces, these may change the tactical methods used, but the political and strategical background will remain the same. The addition of air forces will not make the task easier, except for that side having the preponderating air control and this again is a part of foresight, plan, and preparation, with the odds on the side of the adversary fighting nearest his home base. It seemed almost a foregone conclusion that the naval attack unsupported would fail of its original purpose and it did.

Though the writer devotes no time to the telling of the story of bravery, privation, and suffering caused by this expedition, the history of it is there written in figures of blood. Both sides fought bravely and suffered much as the losses proclaim. The story shows though that bravery alone will not make up for adequate preparation, plan and foresight.

The fourth section "The Conclusion" contains a lesson for us, or rather two. The first is evident; has always been so and the history of this campaign only confirms it. An over-seas expedition if it is intended to amount to anything, to have permanent value can never be conceived nor executed after the manner of a raid. Raids went out of fashion with the passing of the buccaneers, who seized their gold and sailed away with it. Now we seize to hold and from that foothold project other operations. This entails much forethought, preparation, and plans. It is a matter of joint operation not the individual effort of one force, whether it be land, sea or air. The second lesson while not so evident is equally important, perhaps more so. You may perhaps know or at least read of the composition of the war council which directed Great Britain's affairs at the time of the Dardanelles expedition. Only one military man composed it. The voice of the navy was not its competent technical head. Uphold that system if you will but in war it presages defeat. It did in the Dardanelles expedition. Let any of those who advocate a war council for us, composed as was Great Britain's war council of civilian members, when we have a system of central control vested in the President as commander-in-chief of all military and naval forces, stop and think of what happened at Gallipoli.

Reviewed by Captain T. G. Frothingham, U. S. N. R. (Published in Boston *Transcript*).—The ill-starred attempt to gain the Dardanelles was so great a succession of blunders, from its conception to its helpless ending, that the all-important stake at issue has been obscured by the shadow of failure. But it is no exaggeration to state that, in 1915, the possession of the Dardanelles would have been the richest prize in the world for the Entente Allies. As Tirpitz wrote at the time: "Should the Dardanelles fall then the World War has been decided against us." Yet it can now be also stated that the naval and military preparations were never on a basis which promised victory.

Following its tragic fiasco, the whole question of the Dardanelles failure has become a matter of public knowledge. It is now evident that an effort to win the Dardanelles was the best move on the board, and, in the words of the report of the French naval committee, "success was certain," if only an adequate joint naval and military expedition had been planned. It is, however, painfully apparent that the project found the British Admiralty and British War Office at a stage when conditions existed in both that made impossible any such sound plan.

In the Admiralty, Lord Fisher dominated the British naval plans, and, from the very first week of his taking control in the fall of 1914 he had tied fast the British naval strategy to an impractical plan, of the days of Frederick the Great, for landing a Russian army on the Pomeranian coast. So obsessed was Lord

Fisher by his own project for building a special fleet for this one purpose, that he has made the attitude of his régime clear beyond mistaking, as only considering the Dardanelles project in reference to its effect upon his own "Armada." For that was the ill-omened word Lord Fisher chose to designate the fleet for his cherished Pomeranian scheme. As a result, it cannot be said that there was any actual professional analysis of the Dardanelles operation, and the British Navy was allowed to drift into a happy-go-lucky attempt to force the Dardanelles by ships alone.

In the British War Office Lord Kitchener was paramount and was doing things in his own personal way. He sent an army to the Dardanelles, with no plans and no staff organization whatever, under the command of General Hamilton, who had no plans of his own. Consequently, at the time of the last naval attack, the almost incredible situation existed that there was a powerful army present on board transports—and yet this army was so helplessly unprepared that it was actually taken away for five weeks before making its military attack. Thus the naval and military attempts were two widely separated efforts, and this fact gave the Turks such ample time to organize a defense that the whole project broke down helplessly.

Yet, although foredoomed to failure, the naval and military operations provided some of the most interesting studies of the World War. It is in this regard that Captain Puleston's book is of great value. Each phase of the many varied employments of forces has been treated in full detail. In fact the book gives an object lesson in modern naval and military tactics. These are graphically described—and yet with a truly laudable avoidance of length. As he himself has stated on his title page, his book is a "condensed study." The general reader need not be afraid of being immeshed in a mass of technicalities. The situations are reviewed one by one, and the stories of the operations well and clearly told.

As has been stated, these naval and military attempts form two series of operations, with the fatal five weeks intervening which strengthened the Turkish defense. For each series Lieutenant Colonel G. L. McEntee has prepared many diagrams. Captain Puleston's text and these diagrams work in well together in tracing every step of the operations, naval and military. There are sixty-eight of these diagrams, and they are excellently grouped to supplement the text at each stage. This treatment has not been used by others to any such extent as is found in this work. By means of this book, a reader will be able to gain a knowledge of the practical details of both the naval and military tactics of this eventful campaign—and in this way will learn many lessons of modern warfare.

SECRETARY'S NOTES

Circulation

The circulation of the PROCEEDINGS since January, 1926, has increased 588 copies; the membership of the Institute has increased 323 members.

Proposed Changes in the "Proceedings"

The Secretary-Treasurer has received only thirty-five letters from the members of the Institute regarding the proposed changes in the PROCEEDINGS. The changes on which the members were requested to comment were as follows:

(1) Change in name of the PROCEEDINGS;
(2) Addition of interesting illustrations;
(3) Use of the same size type for Professional Notes and other departments, as is used in the main body;
(4) Increase in page size to 7" x 10";
(5) Elimination of either the outside or inside contents page and the use of a three-quarter half-tone illustration on the front cover.

The following extracts from some of the letters received show the reaction of the members in regard to the proposed changes:

COMMENTS OF REGULAR MEMBERS

I have read with interest your note prefaced to the July issue of the UNITED STATES NAVAL INSTITUTE PROCEEDINGS, inviting comment relative to suggested modifications in the format and scope of the PROCEEDINGS, with a view to rendering the periodical more attractive to those in civil life who are eligible for associate membership in the Naval Institute and to increasing circulation. I heartily concur in the view that the result sought to be attained is a desirable one and that its importance justifies careful consideration of suggested plans for its attainment.

The proposed change of name of the PROCEEDINGS to "United States Naval Institute Magazine" appears to be a desirable one. The term "Proceedings" no longer accurately describes the material included in the periodical. It is noted in this connection that the corresponding periodical for the British military and naval service is known as the *Royal United Service Institute Journal.*

The use of illustrations of unusual interest is believed to be a valuable means of increasing interest in the periodical. Existing naval histories contain little beyond the conventional portraits and reproductions of a few paintings. There may be found in such collections, for example, as the

New York Public Library, many relatively unfamiliar portraits and illustrations of scenes of interest in naval history, which are now almost entirely inaccessible to naval personnel, and relatively inaccessible to the majority of those interested in naval affairs. It is believed that the reproduction and inclusion of such illustrations would be appreciated by all concerned.

The proposed changes in format of the periodical are matters of detail. The change in size of page would appear to possess no particular disadvantages aside from introducing diversity in the dimensions of bound volumes of the periodical.

There are certain additional possibilities which have not been touched upon in the statement embodied in the July issue of the PROCEEDINGS, but which nevertheless appear to afford a possible means of broadening the appeal of the periodical:

(a) The scope of the Institute might be broadened to include the Army as well as the Navy, and to correspond in this particular to the *Journal of the Royal United Service Institution* of Great Britain. So far as available information extends the American Army has no organization corresponding to the Institute, nor has it a periodical corresponding to the PROCEEDINGS.

(b) By a somewhat more aggressive effort to bring the Naval Institute and its work and the PROCEEDINGS to the attention of those interested in the study of American history, a service of considerable importance might be rendered not only in increasing interest in the Institute and in the periodical but by stimulating research and publication in a neglected aspect of American history. The membership of the American Historical Association would no doubt furnish a fruitful field for publicity designed to bring about a more adequate understanding of the place and importance of naval history in the broader field of American historical study. The trend of the past two or three decades has been in the direction of minimizing the importance of political and military history and magnifying correspondingly the emphasis placed upon institutional history, more particularly upon economic and social factors. As a result, the majority of the younger historical investigators not only possess a relatively inadequate background of acquaintance with the facts of military and naval history, but are disposed, perhaps, to undervalue the importance. By well planned effort in this direction the Institute might do much to raise up successors to Mahan.

At the suggestion of ——— ———, I am writing you with regard to the proposed changes in the Naval Institute. Previous to reading ——— ———s' letter I had expressed somewhat the same views to ——— ——— and after reading ——— ———s' letter am inclined to agree with him. I base my opinion on the general grounds that

(1) The Institute is admittedly the best professional publication either in this country or abroad and fulfills its special mission better than any other paper.

(2) The Institute is also highly successful commercially.

On these two general assumptions I think you should go very slowly indeed in making changes, especially when those changes have in view a straddling of the present mission with an additional one, which latter may possibly impair the former.

I was much impressed also with the letter of ——— —. ———, who appears to have had considerable experience in the newspaper business. He emphasized the factor of the "trademark" or "goodwill" which goes with the name and general appearance of the paper, together with the sentimental and traditional sides of the same question.

I think it would be well to go very slowly on any changes of consequence and would advise that if changes are to be made that they be made one at a time so as to be sure that you are on the right track. Of course, I don't mean minor changes such as increasing the size of type of the Pro-

fessional Notes but this can be done without enlarging the dimensions except as to thickness.

Referring to the five suggestions for changes in U. S. Naval Institute PROCEEDINGS:

(1) Why not change the name of our publication to read "U. S. Naval Institute"? Why add "magazine"? (2) More pictures, yes, but carefully selected for their professional value and interest; (3) Good; (4) Good; (5) Retain only the inside contents; adopt engravings; cut out Academy seal.

In the Naval Institute PROCEEDINGS for July, 1926, comments are requested on the five suggested changes in the PROCEEDINGS. The following are my comments on each specific instance:

1. I recommend leaving off the name "Proceedings" because this word is superfluous in every way and is rarely used and almost unknown to readers of the Naval Institute. This publication has become known throughout the service as the *Naval Institute* and no other appellation is needed.

2. The addition of pictures and illustrations will go a long way to make the *Naval Institute* more attractive.

3. The question of the size of type to be used I do not believe interests the readers of the *Naval Institute* except that it be large enough to obviate the use of glasses to persons of average eyesight.

4. I do not approve of the increase in page size of the *Naval Institute*. The storage space on bookshelves of the average naval officer, particularly on shipboard, is limited in capacity and the present size is believed to be much more suitable than that of a larger size page. In addition, there is a disadvantage of having bound volumes of a different size from previous volumes.

5. It is agreed that there is no necessity for two contents pages but I think that the one on the outside of the front cover should be preserved rather than the inside one. It is probable that no one ever looks at the inside one while the outside one is in the most agreeable position for ready reference. To cover the front page with a half-tone engraving or illustration would be to place the *Institute* in the category of cheap non-professional magazines and would serve no useful purpose—the average naval officer is most likely satisfied the way it is and it probably would not appeal to members of civilian life who take the magazine to preserve old associations. Any change in the external appearance of the publication would be most inappropriate.

I have read with great interest the proposed changes in the make-up of the PROCEEDINGS and would like to go on record as being unqualifiedly in favor of all five of them.

I would suggest that the present inside title page be adopted for the outside cover, with the substitution of the word "Magazine" for the word "Proceedings," and with no other changes.

In response to the request for comment on proposed changes in the character of the PROCEEDINGS I desire to offer the following:

The title page of every number of the PROCEEDINGS bears the following sentence in italics: "For the advancement of professional, literary and scientific knowledge in the Navy." This we may safely assume to be the mission of our publication. In my opinion the significant part of this mission lies in the last three words "in the Navy."

Now, if only fifty per cent of lieutenants and lieutenant commanders, sixty per cent of commanders and seventy per cent of captains in the Navy are members of the Institute, it seems that any attempt to popularize the PROCEEDINGS with civilians is apart from the mission, if we assume, as I think we can safely do, that the missing percentage in the higher grades is not due to lack of professional interest.

I thoroughly agree with any changes contemplated in furtherance of the mission and in capturing the interest of the missing percentage of naval officers. I do not agree with any attempt to popularize the PROCEEDINGS with the public. It is neither a proper medium for recruiting propaganda nor a short story magazine.

For sentimental reasons I am not in favor of changing the name or form of the PROCEEDINGS. If changes of this kind are started, any traditional value of the appearance will disappear. I am in favor of emphasizing and enlarging the volume of the Professional Notes and Notes on International Affairs, because among many officers of my acquaintance this seems to be the most valuable and interesting part of the publication.

It is requested that I be recorded as voting in the affirmative on the five questions submitted to subscribers on the pink fly-leaf of the July issue.

In regard to your notice in the July issue about suggested changes in the form and cover of the Institute I think that "Proceedings" is a misnomer but I do not quite like the "Magazine" as it suggests to me fiction, etc., as produced by yellow journals and not the high class matter appearing in our periodical. The only word that comes to me at present is "Monthly," which suggests *Atlantic Monthly* and a higher plane of literary endeavor. "Journal" and "Chronicle" are very much overworked terms for this type of publication.

The addition of pictures is a good idea as the average man is attracted by interesting illustrations. I personally would like to see more reproductions of historical pictures rather than photos of current events in the Navy. Changes 3 and 4 appear to be sensible and may help to attract some of the fifty per cent of lieutenants that don't belong.

The argument I have heard advanced against change five is that the present cover is well recognized from long usage and represents a certain good will factor. On the other hand a periodical cover with an attractive picture is liable to be picked up by the layman who may then be interested in the contents. This is used as an eye-catcher by most advertising pamphlets. I enclose a cover I made up to show how the July number would look with the changes made.

The suggested changes in the *Naval Institute* are excellent. In making the Institute PROCEEDINGS or "Magazine" more attractive to civilians it will become more interesting to a greater number of officers of the line, staff, marine corps, coast guard, merchant marine, and Army, so that there will be an increased membership from both civilian and service sources. This, of course, in obtaining suitable material, will add greatly to the work of the editorial staff.

I now hear the articles of the *Institute* discussed to a greater extent than ever before and I find them of much greater interest. If they maintain their present standard, no officer who wishes to keep up with his profession, can fail to read them.

In regard to the questions offered in the July number of the Institute PROCEEDINGS any thought on the ideas advanced is bound to produce either dogmatic opinions or chaos, but since comment is desired the following points are offered:

Of course, as you state, the word "Proceedings" is a misnomer, and no reason for continuing its use except a sentimental one exists. Sentiment and tradition, however, are too closely blended with the present in forming the ideas and ideals of those in the naval service to allow us to lightly cast them aside. The mission of the Institute publication, as stated on its inside cover sheet, is "For the advancement of professional, scientific and literary knowledge in the Navy." This mission in itself limits the intended usefulness of the publication to those in the Navy and to those in civil life who, from previous naval service or from intimate naval association, have the interest and the point of view of the service at heart. It seems to me that we would be making a grave error in changing the title of the publication in order to have it make a stronger appeal to the civilian mind. The publication of the Naval Institute is essentially a technical publication similar to those of the military service and of the technical societies and, as such, it is not intended to, nor is it believed desirable to have it, make a stronger appeal to the civilian mind. It is not a magazine. It is not believed that the officers who are responsible for its present high standards and for its great usefulness, wish it to become a magazine. If it is not a magazine and if it is not the intention nor desire (which intention and desire I am assuming, from a fifteen-year study of its development) to have it a magazine, then why call it one? Call it the "Journal of the Naval Institute," which it is, or even the United States Naval Institute PROCEEDINGS, which it is not; but do not shift from one designation which is a misnomer to another designation which is equally a misnomer.

Unfortunately, the discussion of the proposed change in the name of the publication is so intimately involved with the question of making the publication more attractive to the civilian mind, with the idea of increasing the size of the civilian associate membership, that the two cannot be discussed separately. The influence of the civilian attitude towards the Navy is so very important a factor in the well-being of the service that we are not more justified in lightly disregarding it than we are in lightly disregarding the traditions of the service. The splendid work of the Navy League has been of inestimable value to the Navy. The whole-hearted support given Navy Day throughout the country has had a most beneficial result in gaining warm sympathy for us and our work. These interlocking influences must always be regarded by us not only in our relationships with civilian life but even in our relationships with each other.

The publication of the Naval Institute is essentially "for the advancement of professional, literary, and scientific knowledge in the Navy." Always bearing that in mind, we are then justified, I feel, in making the publication as interesting as possible so that it will make a stronger appeal to the civilian mind.

I am in full sympathy with the suggestion that pictures and illustrations of unusual interest be included in the publication, and feel that the approval of the suggestion by the Board of Control is another manifestation of the excellent results they have produced.

The third suggestion, that the same size type for Discussions, Professional Notes, Notes on International Affairs, and Book Reviews is most satisfying. Frankly, I turn to the Professional Notes first of all and then to discussions of previous articles. I have been greatly disappointed in the method of presenting the Notes on International Affairs due to their stereotyped news-clipping appearance, but recently I have noted, with pleasure, a tendency to digest the news into readable articles. I regard this criticism as extraneous to the suggestions upon consideration, but the tendency towards a better method of presenting the Notes on International Affairs is regarded as too important to pass up without comment.

The suggested change in the size of the pages is in keeping with the suggestions in regard to unusual photographs and illustrations and with increasing the size of type and is believed perfectly sound.

(5) Personally I had rather not see this suggestion go through. William Lyon Phelps has said that magazines are divided into two classes, those with girls on the front and those that don't sell. The elimination of the Naval Academy seal is sound, and a three-quarter page half-tone engraving of an appropriate illustration will not appreciably detract from the dignity of the publication. Any engraving which was not appropriate would most certainly detract from it, and rather than run the possibility I would prefer the same front cover on all issues. I agree there is nothing gained by having two tables of contents.

These comments have been much fuller than I intended, but before I close I would like to take this opportunity of expressing my appreciation of the work done by the Board of Control.

In reference to your special announcement in the Secretary's Notes of the Institute PROCEEDINGS for July 1926, please permit me to suggest that the name of the Institute PROCEEDINGS be changed to read "Journal of the United States Naval Institute."

I am in favor of making all of the changes in the PROCEEDINGS of the Institute as suggested in the Secretary's Notes of the July issue.

In response to the recent proposed changes to the Naval Institute PROCEEDINGS, I wish to submit the following comments:

The proposal to change the present title to "U. S. Naval Institute Magazine" did not appeal to me. This may be based on mere personal impression. An attempt to analyze this impression revealed that I felt the word magazine, to be, first of all, unfamiliar in connection with the Institute publication; second, a less distinctive term than "Proceedings." I do not believe that the change of name would make the publication more generally attractive—that must be done by other means, and if such an appeal is developed, I feel that the subscriber will be content to think of it as the U. S. Naval Institute PROCEEDINGS without stopping to analyze the meaning of the name. In fact, while the word, proceedings, may not be particularly apt, it seems to me to possess a shade of distinction, the sound of the word if you will, that definitely marks off this publication from all others in the service. I should vote against changing the name.

I believe that the addition of pictures and illustrations would lend added interest to articles of a technical nature.

An increase in the size of type used in the after sections of the PROCEEDINGS would, I believe, increase the attractiveness.

The size of the National Geographic is 7" x 10"; this magazine has always appealed to me, not only as regards contents but also makeup. However, a magazine of that size printed on the same paper as that now used for the Institute PROCEEDINGS may not present as attractive an appearance as it does now. It might be possible to make up a copy and see how it looks with the new dimensions and a uniform size of type.

The use of appropriate half-tones on the front cover is, I believe, another means to improve the attractivness; the interest is stimulated and the attention is held. I am enclosing a sketch; the title at the top and the seal at the bottom balances the page vertically and horizontally. The seal would be printed in light ink so as to be visible, yet superimposed on the cover page illustration.

In general, I should be opposed to a change in name, and feel that a change in size of page would be inadvisable.

I was greatly interested to read in the last issue of The Naval Institute about the proposed changes in makeup, etc., and the evident inten-

tion to enlarge the scope and distribution of the PROCEEDINGS. I am going to take the liberty of submitting the following suggestions:

Why not go out after the officers who are not subscribers and build up your membership by gathering them into the field? I notice that Admiral Cowie is having wonderful success in getting new members for the Navy Mutual Aid; by following his methods you might be able to round up the officers who are not subscribers at present.

In my opinion it is going to be very slow work to get new associate members, as there is already more solid reading matter than most of us can handle at the present. Almost everyone has to pass by a lot of constructive and entertaining books or articles simply because lack of time will not permit their being taken up. Members of the Institute may, however, be requested to bring the PROCEEDINGS to the attention of their friends in civil life and to send their names in to the Secretary-Treasurer as possible prospects to whom advertising matter may be sent and whose membership in the Institute might be solicited.

I would be greatly disappointed to feel that the PROCEEDINGS might lose their present high professional character through any attempt to popularize them in order to attract civilians' subscriptions. You and others on duty in the Navy Department (particularly in connection with the question of war-time activities in the supply line) would be able to block out certain classes of men in civil life who are interested in the technical and engineering problems that confront the Navy: It seems to me that those are the men that we would wish to add to our list of associate members.

By all means do not change the title of the PROCEEDINGS! This title has been most honorably worn for many years and even now it is not a misnomer in view of the discussions of the various articles. In other words, it seems to me that these discussions still give the Naval Institute its character of forum almost as effective (if not more effectively, because of the number of officers reached) as did the personal gatherings of many years ago.

You will undoubtedly find that by increasing the page size a considerable saving will be made in the cost of publication of the PROCEEDINGS which would more than make up for the extra illustrations that may be used.

I believe that the idea of having a three-quarter page, half-tone engraving on the outside front cover is excellent. It will be a simple matter to select appropriate subjects for this, but the Board of Control should bear in mind that only the highest grade printing will present these subjects attractively and adequately. In other words, a good subject would be utterly ruined if the printer is not called upon to do his best.

I cannot say too much in praise of the PROCEEDINGS as they are now issued, even if I don't find as much time to devote to them as I would like to. Your Board of Control is entitled to every credit for the excellent manner in which they are now handling the affairs of the Institute.

The following are extracts from a letter received from a rear admiral on the active list:

I was much interested in Mr. ————'s letter and it seems to me that we said just about the same thing. I agree with him about the name, Proceedings. For Heaven's sake, change that! I would call it "The U. S. Naval Institute Magazine" or "Monthly." Don't say Bulletin. Change the cover, cut out the gravestones, put pictures on it, and make it more popular.

The Navy should have a medium of communication between it and the public. The Naval Institute could do it if it has the brains and the progressiveness. I agree entirely in regard to the use of pictures. They

are most important. I think the Professional Notes should follow Mr. ————'s ideas. There are entirely too many of them and most of them you can read anywhere else. I have said what Mr. ———— said. Cut the articles down. There is altogether too much superfluous talk. Mr. ———— says "lighten it up." That is my idea. Mr. ———— calls the Naval Institute the "sleeping potion." I think that is a little unkind, but still it has some truth in it even if it stings a little.

I think that since the war the Naval Institute has steadily improved, but it does not yet sufficiently exercise the right of selection and restriction on the articles admitted to its pages. It does not pay enough by half, and I think that the very technical articles probably should not be printed in the Naval Institute at all. A limited number of such articles should be printed as a pamphlet, and notice be put in the Naval Institute in the reading section that such articles have been printed and will be sent to anyone interested in them. There is no doubt in the world that very few people are interested in those very technical articles and that very few read them. Therefore, why clutter up the Naval Institute book with such things when a few copies could be printed for those who really want them?

I don't think that ———— or any similar publishing house will take any interest in the Naval Institute as it is now, and I don't blame them at all, because I find myself interested in only about one-half of what appears in the Institute—perhaps even less. The reason that things get through the Naval Institute is probably because the board is too busy to read all the articles carefully. It is so much better to scrap a lot of articles you paid for at poverty prices rather than print them in the PROCEEDINGS when they are not worthy of it. Better tear most of them up and start afresh. As the Institute is in good shape financially, I would suggest that this is a very good time to carry out Mr. ————'s suggestions and mine. I hope you will place all of my letters before the Board and also Mr. ————'s.

What reasons have people for opposing an increase of circulation of the PROCEEDINGS? One of its most valuable attributes could be to spread the knowledge of the Navy and naval subjects to the people of the country. I would like to see it have the same circulation that the *National Geographic* has.

The following are extracts from a letter received from a rear admiral on the active list:

I have re-read and given some thought to the pink sheet entitled "IMPORTANT" inserted in the front of the July 1926 number of the PROCEEDINGS and I ask permission to submit to you my feelings in this matter and the reasons. The information from which we start out is the circulation figures: (a) for the active list of the line. (b) from the membership of the Navy League.

In the case of (a) the Navy line membership runs: Rear admirals, nine out of ten; captains, seven out of ten; commanders, six out of ten; lieutenant commanders and lieutenants, five out of ten; lieutenants (jg) and ensigns, apparently so meager as not to be mentioned. In the case of (b), two hundred fifty associate members from civil life.

From that information you derive the mission that it is evident that we should make the PROCEEDINGS more attractive for civilians. The courses of action which are laid down for argument are:

1. Change the name to U. S. Naval Institute Magazine.
2. Addition of pictures and illustrations.
3. Alter the internal style by going into one sized type.
4. Increase the PROCEEDINGS to 7" x 10".

5. To cut out the Table of Contents on the front cover in order to make space available for picture.

6. To remove the Naval Academy seal from cover.

I wish to protest strongly against the changes proposed under 1, 4, 5, and 6. To me, personally, who has been a member of the United States Naval Institute for thirty-five years, the title "Proceedings," the standard size of the publication, the table of contents on the front cover and the coupling of the seal of the Naval Academy and the seal of the Naval Institute have a very strong sentimental appeal. I should hope that the Board of Control would be strong enough to resist "whimsical waves" which sweep over the Navy all too frequently.

With respect to item two, if you must add pictures as a selling proposition, you make a tacit confession that you are unable to appeal to the intellects of people but must appeal to their sense of sight.

With respect to item three, one of the attractive things about the present PROCEEDINGS is the internal architecture in which the different sizes of type are used with judgment. Being fifty-six years old, I do not find the small type difficult to read.

And here you make an admission that you have an increased income from the PROCEEDINGS at the present time. If that is the case, the financial condition of the Institute would seem to be satisfactory and there is no excuse for engaging in a selling campaign, such as I understand you propose.

With regard to item four, I strongly object to starting a new size of the book which will throw out of standard all previous numbers which are now being kept by older members of the Institute. This may be an important matter to the older members.

And I object to any idea of making space for a picture on the front cover which would tend to degenerate our publication to the level of a 7″ x 10″ trash, carrying pictures of bathing beauties, now so prominent on the news stands. You would do much better to examine the higher grade of monthly publications in the country, with the result that you would find that the present set-up of the PROCEEDINGS resembles a considerable number of them and compares favorably.

I think you have adopted an incorrect mission. I think you make a mistake to consider making the PROCEEDINGS attractive to civilians.

I beg of you to maintain the PROCEEDINGS in its present dignified form and to set for yourselves the mission: Improvement in the character of the contributions with the end in view of making members of the remaining one out of every ten rear admirals, the remaining three out of every ten captains, the remaining four out of every ten commanders, the remaining five out of every ten lieutenant commanders and lieutenants, and of getting a greater number of lieutenants (jg) and ensigns to join.

Let me repeat, it is my feeling that the PROCEEDINGS should be made to appeal to every line officer's *professional side.*

COMMENTS OF ASSOCIATE MEMBERS

With reference to the Secretary's Notes in the July 1926 issue of the PROCEEDINGS, I believe that the PROCEEDINGS can be made attractive enough to appeal to the type of civilian reader it is desired to reach by some method other than radically changing the distinctive character of the publication and in no way sacrificing the mission of the Institute: The following suggestions are offered.

1. That the name be changed to read "United States Naval Institute Monthly." To a person looking over a number of magazines this title would indicate a compromise between the contents of the publications commonly known as magazine and the better class of literary and profes-

sional publications commonly termed "monthly," "quarterly," etc. The word magazine appeals more to the ordinary, indiscriminate news stand buyer of publications, whereas monthly and quarterly make a distinct appeal to the type of person it is intended the PROCEEDINGS should reach. It is believed that the title I suggest would arouse the interest of the civilian interested in naval and seafaring subjects. The title of the publication is now misleading, and leads a civilian to believe that the contents are too technical for his perusal. I do not believe that the contemplated new title of U. S. Naval Institute Magazine is dignified or distinctive. I would prefer to have the old name PROCEEDINGS retained than to have the word magazine used.

2. That the addition of pictures and illustrations do create more interest and are apt to attract the attention of the civilian reader.

3. That the same size type be used in Discussions, Professional Notes, etc., as at present, but with wider spacing between lines, unless the size of the PROCEEDINGS were changed to permit of larger type.

4. The PROCEEDINGS, in its present size, is a handy, compact and comfortable publication to handle in reading. It is also an excellent size for binding and fits well in the average bookcase, particularly those on shipboard. It is recognized that the larger size, namely, 7" x 10", would materially offset increased cost, but it is questioned whether this should be given as much consideration as the foregoing. If any increase in size is contemplated I would suggest 6½" x 9½".

5. It has been noticed that magazines of a distinctive character generally have a contents page on the front cover, either complete as in the case of *Atlantic Monthly* or two contents pages as in the case of other magazines of equal literary value. I consider the front cover of the PROCEEDINGS, as now printed a very desirable one and would dislike to see its distinctive character changed.

Some further suggestions:

(a) If it is contemplated to introduce the publication through the news stands to the general reading public, I believe that a greater appeal to that public will be made by changing the name to Monthly, as suggested by me in paragraph (1), and incorporating the seal with the name of the publication, thus leaving space available for a three-quarter page halftone engraving.

(b) Very few seafaring men of the officer class in the merchant marine, even those who served as officers in the Navy during the World War, know of the PROCEEDINGS. I feel that steps taken to bring the publication to their attention, if possible through the various hydrographic offices of the naval districts, would result in a wider distribution and an increase of associate members, which I presume is the present aim of the Institute.

(c) That steps be taken to have the PROCEEDINGS on the library tables of the better clubs and associations (such as marine and pilot associations) throughout the country. This could be done by a solicitation of the librarians of the various clubs or inserting a notice in the PROCEEDINGS asking for the cooperation of all naval officers who are regular or associate members of such clubs and associations in bringing the publication to the attention of the librarians.

In reply to your request in the July issue of the PROCEEDINGS, I am going to send an expression of opinion as to the name and make-up of the PROCEEDINGS. I am making bold to do this because of the fact I am in the newspaper business, am now in civilian life, and have been in the active service of the Navy, which gives me a three-sided view of the problem.

First of all is the proposed change of name. I am opposed to that for the reason that we have too little tradition in this country and for more

than fifty-two years the PROCEEDINGS has carried the name it now goes under. Its record and identity is most firmly established and I feel that a change of name would be undesirable. As I see it the name is not necessarily a misnomer, for while it may have originally recorded the business conducted at meetings of the Institute, it now is the medium of transmitting expressions of opinions of the naval personnel on various technical subjects, merely in lieu of having papers read at such meetings. It can be likened to a proceedings of a correspondence course of lectures. In fact it could be termed proceedings with no element of error merely because the annual proceedings of the meeting is given, while the other monthly issues might be considered as supplements.

I really believe there is much to lose and little to gain through a change of name, and any way didn't the Bard of Avon ask what was in a name?

The suggestion of changing the make-up of the front page is an excellent one, for the addition of an attractive half-tone would be most desirable, in addition to eliminating the waste in space caused by devoting two pages to the table of contents. The seal of the Institute and the Navy might be incorporated in the make-up of the head.

Changing the size of the magazine I believe is a minor problem and if the saving in cost justifies it should be done so as to have the Professional Notes and Notes on International Affairs in larger type.

As I see it the big problem is to make the publication more attractive to civilians interested in the Navy and maritime affairs without losing any of the most splendid features of interest to the Navy personnel from the technical viewpoint.

Such a problem requires considerable study, but I believe can be accomplished, for in the first place the civilian who is interested in the Navy will have to a greater or lesser degree an interest in the technical problems of the Navy, as well as in the broader and more general conduct of the Navy.

For instance, articles on seamanship and navigation should be of interest to yachtmen and mariners in general; articles on aviation should appeal to a great number of people in civilian life, especially articles dealing with the development of aviation for over-seas work, which is naturally allied to the Navy even if confined to commercial flying. Articles on the various problems of the Navy, such as selection, corps activities, and work and other branches should be of interest to the civilian through bringing him closer in contact with the Navy and giving him a better understanding of what the Navy has to cope with.

The PROCEEDINGS can be made an important factor in bringing the people of the country into a closer contact with the Navy and its problems, with benefit both to the country and the Navy. Such a mission is an ideal one. On the other side of the problem, it could also aid the naval personnel to maintain a closer touch with the civilian viewpoint.

There is no question about the appeal of historical articles about the Navy, marine corps, and their work. Too much of that sort of material cannot in my judgment be used, of course provided that the PROCEEDINGS are not turned into a historical publication only, for we have the problems of today and the future to consider, but history also enables us to better meet and cope with them.

The historical articles in the PROCEEDINGS are excellent and I know of several instances where they have been used by civilians as quotations for purposes other than mere Navy talks or articles.

In considering the question of broadening the appeal of the PROCEEDINGS the use of fiction would naturally come up. Fiction would undoubtedly appeal to a great many readers, but on the other hand, would they be readers of the class and caliber to benefit by the more serious articles? I feel that the articles on history of the Navy, on its present-day problems are more interesting than fiction, and besides the PROCEEDINGS would have

to compete with publications handling a high class of fiction, the cost of which is tremendous.

The Professional Notes and Notes on International Affairs are of great value in giving a general picture of naval affairs and international happenings in all parts of the world. But such material as is used must be as timely as is possible with the limitations created by putting the publication on the press.

In discussion of timely articles, it might be possible to make use of the Navy Department News releases in digest form for the PROCEEDINGS by having a late form to catch the material up to the latest possible time. Such news could have ship movements of prime importance, such stories as the plans for the maneuvers off Naragansett Bay next year and so forth.

The greater use of pictures is also a desirable feature in attracting members other than those immediately interested in the Navy. Use of striking pictures was more than fifty per cent of the appeal of the Magazine, *Sea Power*, published several years ago by the Navy League of America. The articles in that publication were a dead loss as far as information was concerned, but the pictures sold the publication and membership in the League, as attested by a comparison of its present membership and that of twelve or thirteen years ago.

Extension of membership to civilians I believe is a desirable thing for many reasons, the chief of which have been given already. By advertising in some national magazines, say the *Saturday Evening Post*, members could I believe, be attracted by the quality of the magazine as it now is. The appeal to civilian members might also be widened by having stories on the development of our merchant marine, that is, fact stories. That is merely a side suggestion, for I am of the opinion that the PROCEEDINGS now offers goodly interest, but that the need is to tell the civilians about the publication.

If I may make the suggestion, it might be well to canvas members of the various yachting clubs, officers of the merchant marine, personnel of the organizations dealing with maritime commodities and so forth. Naval reservists ought to furnish a fertile field of members. Within the past six months I have rounded up two reservists who have joined the Institute and have told several others about it and find their interest keen. They simply didn't know there was such a publication, or at best, what it contained.

In closing, let me take another shot at the change of name. *The Saturday Evening Post* is a name to be reckoned with in the publishing field. That name is a misnomer for the magazine, while dated Saturday is circulated Thursday, it is no longer a Post in the strict sense of the word, but I daresay they would spend millions of dollars in resisting a forced change of name.

In the July issue of the PROCEEDINGS I note your page headed "Important, please read." In re the foregoing, I believe the change of name of our publication to "The United States Naval Institute Magazine" would be an excellent idea. I would suggest that United States be used in full and not U. S., as I think it undignified.

The proposed changes in paragraphs two and three would meet my approval. A lot of us have not now as good eyes as we once had.

I also can see no objection to paragraph four suggestion.

As to the fifth, the front cover would be excellent for half-tone engravings of historic ships of the Navy. At present everybody loves ship pictures and models. Such views would help to popularize the Navy which needs all it can get, in order to have sufficient amounts of money voted for it by Congress.

Also, I can see no reason for maintaining the seal of the Naval Academy on the cover, for we are something else.

I don't know that I am entitled as an associate to vote on the proposed changes, but you asked for opinions. Also I have been an associate member for over thirty years and the Institute is dear to me. You cannot have many who have been with you that long.

As a newly-elected civilian member of the Institute, may I offer the following comments on the proposed changes in the publication form of the PROCEEDINGS:

1. Change from proceedings to magazine would be immaterial to me. As a member of two technical bodies whose papers appear under the caption "Proceedings" the term appears to me as a rational one.

2. Pictures are always worth more than pages of printed matter in catching the attention and making a subject clear. I think this is a suggestion of importance as bearing on non-professional members, like myself.

3. I would favor the use of larger type for Discussions, etc., as the present compact mass of rather small type in which this material is presented looks rather formidable to one who may be only mildly interested in the topic under consideration.

4. Increase in page size is immaterial to me, from the convenience standpoint, but if it will aid in facilitating publication, I am in favor of it.

5. I have always found the cover index very handy in locating the particular issue containing any desired article. Otherwise, the reader has to open the volume and pass through several pages of advertisements which precede the body of the magazine; a process admirable from the advertisers' standpoint but not working to the reader's convenience. I grant the attractiveness of a cover illustration, changing with each issue.

While opinions were not solicited on this point, I cannot forbear to remark in closing that I feel that an effort should be made to increase the number of civilian members and arouse and hold their interest in the Navy and its affairs. I believe this can be achieved in large part by the presentation of articles bearing on anything that pertains to the Navy, prepared in a way which will be intelligible to the lay reader. I do not mean the magazine should be given up to articles of this type, as it is primarily intended to serve as a means of exchange of ideas on technical subjects between officers in the service. You are now following my suggestion to a marked degree and I want to see a continuance of the practice, even increasing the proportion of less technical articles as circumstances may warrant.

I have just had an opportunity to read and consider the suggestions contained in the insert of the July issue of the PROCEEDINGS, and as a civilian member of the Institute, although still an officer in the Naval Reserve, I desire to emphatically vote against any radical change in the policy or make-up of the magazine. As it is today it is attractive, well balanced, and contains something of interest to every class of reader. I leave it around my library and the whole family reads it, for in almost every issue there is something historical or popular which appeals to the women folk, while Notes on International Affairs is the best synopsis of its type published in English.

I thoroughly agree with those who would like to see a popular magazine for the education of the general public in naval matters. I believe that a field for such a magazine exists and have always regretted that the Navy League found it necessary to abandon the publication of *Sea Power*. But I hope that in the near future either the Navy League or some other organization will find itself in a position to give us such a publication.

Under no circumstances, however, do I believe that the *Naval Institute Proceedings* should be changed either as to form or policy.

I would like to take this opportunity to congratulate you on the splendid issues which have come out under your direction and to assure you that in my opinion the magazine is today ably maintaining the high purposes and patriotic aims of its founders.

I heartily endorse suggested changes numbers 1, 2, 3, and 4 in the Institute PROCEEDINGS. As regards the fifth suggestion, it does seem unnecessary to have two contents pages. My idea regarding this would be to retain the outside cover as it is and do away with the inside contents page. Why could not this latter be used as an advertising page?

The suggestion to put a half-tone engraving on the front cover does not seem entirely practical. At least I cannot think of any engraving which would be significant and suitable. It would be very expensive to change it with each issue in order to have an engraving which would refer to the leading article in that particular issue, and as the Institute has no buildings, properties or individuals that could be regularly pictured which would add to the interest and attractiveness of the magazine I don't see what picture could be well used.

In reply to your request for comments on proposed changes in PROCEEDINGS please be advised that I am in favor of the entire five.

1. The word magazine is so much used by the reading public that in an expansion campaign it would be advantageous from a selling standpoint while not detracting any from PROCEEDINGS as now published.

2. The addition of pictures would be the most valued improvement that could be made. With the official naval photographs to draw from and pictures taken by naval personnel from every port of the globe, PROCEEDINGS could be made exceedingly interesting pictorially. A standing prize for interesting or unusual photographs would assure an adequate supply.

3. Enlarging the type as suggested would be a good improvement if the cost was not prohibitive, but size now used is not difficult to read.

4. Increasing size of PROCEEDINGS to standard would be in keeping with the other improvements.

5. A half-tone engraving on the front cover depicting naval scenes, history, and traditions, would do much to create public interest in and respect for things naval. I should like to see a full color cut of the National Emblem on the first copy. There is nothing so intimately associated with the Navy as the colors.

I have noticed a constant improvement in PROCEEDINGS since becoming a member, and am personally interested in its betterment. It seems to me there is room in this rather technical publication for stories of travel in foreign countries, as they present the personal view and can be classed as literary knowledge. These stories properly illustrated would compare favorably with travel books, which are nearly always best sellers.

The Naval Reserve should be interested in PROCEEDINGS, and would suggest, with the first issue of the improved publication, that a sample copy and application be mailed to reservists in good standing.

Replying to your printed request in the July number: I beg to say that the opinion of both my wife and myself is that the present form of the magazine is best suited to our interest. The changing of the front page to a *Geographical Magazine* or *Times Supplement* would destroy its present dignity. The size of the magazine is perfect, its printing unexcelled, and its material well proportioned between technical and of general interest to those civilians who wish well to our Navy and are interested in the details of its history. Such pieces as the "Navigation of Columbus" are intensely attractive.

In answer to the secretary-treasurer's request for comments on suggested changes, may I make the following:

As a Naval Academy graduate, I am probably more interested in naval affairs than the average citizen; nevertheless, I do not understand, and therefore am not interested in, more than half the articles in the PROCEEDINGS.

I read a larger percentage of the articles in the *Atlantic Monthly, Forum, National Geographic, Century,* and other magazines, than I read in the PROCEEDINGS; but I enjoy much more the articles I read in the latter than those I read in the former. This indicates to my mind that technical articles can be made extremely interesting to civilians, if written in language they understand.

A publication, written and edited by naval officers, should have a tremendous appeal to the general public. Consider the possibilities of an issue containing such articles as the following:

Recollections of Woodrow Wilson, by Admiral Grayson
The Honolulu Flight, by Captain Rogers
The North Pole Exploit, by Commander Byrd
The Japanese Earthquake and Fire, by the Naval attaché
Foreign Customs and Sports
The Tidal Wave at Arica
Sea Words on Shore Duty
Historic Ships of the Navy

In a recent issue of the *National Geographic,* there is a splendid article by a coast guard officer on ice patrol, accompanied by magnificent photographs. I do not think the word, magazine, should be used. Were the *Atlantic Monthly* called "Atlantic Monthly Magazine" would it not lose standing? In my opinion the cover should not be changed. It is most attractive and dignified.

I have had no experience with, and know nothing about, the publication business; but I believe a venture, along the lines above suggested would be profitable, and, within a few years, capable of paying fair prices for material. I, for one, would make an investment in such a venture, were it offered.

Without doubt, the technical articles published in the PROCEEDINGS are of great interest to its professional readers and they should be continued.

In the July number of PROCEEDINGS you request comments on five suggested changes. May I present my own reactions?

(1) The articles in the PROCEEDINGS are presented to the membership for consideration and discussion just as truly as if the members were assembled in a meeting. It seems to me that the word, proceedings, is eminently fitting; and quite suggestive of the purpose for which the Naval Institute exists. Let us not jump into the already overcrowded "magazine" market. Let us rather keep our own distinctive and appropriate name, Proceedings.

(2) Pictures and illustrations are certainly desirable.

(3) Larger print for the Discussions, etc., is desirable if the cost is not prohibitive.

(4) I can conceive no serious objection to increasing the page size of the PROCEEDINGS, especially as the change will reduce the publishing cost.

(5) The purpose of both the Naval Academy and the Naval Institute is naval education. Therefore doesn't it seem very appropriate to you that the two seals appear side by side on the front cover of the PROCEEDINGS? Personally I should be very sorry to see the very convenient table of contents disappear from the front cover and give place to anything suggestive of the ordinary magazine.

Permit me to thank you and all the officers of the Naval Institute for the hard work and conscientious effort that have done so much to make

the PROCEEDINGS the valuable publication that it is. Let us do nothing to detract from the purpose of the Institute, not even to the extent of abandoning the distinctive characteristics of its official publication.

The following from a captain (Retired) French Navy:

Although being a foreigner, does the fact that I am a regular member of the U. S. Naval Institute entitle me to formulate an answer to the questions made on the two rosy tinted pages enclosed in the last number? The following are the suggestions I directly write down in case the Institute may care for such from abroad. As a navy man, and on this exclusive view point, my opinion is that the PROCEEDINGS would lose much of its apparent character through submitting it to any change brought to its actual presentation. Its external aspect: elegant—original—navy-like—should stay! I should agree to scratch PROCEEDINGS but do not think proper the proposed substitute, magazine, a term generally intended for miscellaneous literature, but not for principally technical matters. I should prefer "Monthly Review." Would not the scrapping of the Naval Academy seal be damageable? According to the fact that most members of the PROCEEDINGS have gone through the courses of their studies precisely at Annapolis? Following the above opinion I should prefer keeping contents on the cover, suppressing it inside. As for the size of the types, no change should be made if the book is not being enlarged. If contrarily the PROCEEDINGS are to grow to 7″ by 10″, then the larger of the two types should be preferred. On another view point, viz., propaganda among civilians to create a favorable recruiting atmosphere (as much needed in the United States of America as it is now in France) it should be undoubtedly proper to recruit as many civilian members as possible: Some sacrifices should, then, be made, giving the necessary space to appropriate illustrations and pictures, and to articles of general comprehension. But, in the meantime letting the publication bear its general sea-born aspect as a token of its origin and *raison d'être*. Croyez, Mon Cher Secretary and Treasurer, à mes sentiments de bien cordiale cameraderie.

At least once a year I am moved to write to the editor of the PROCEEDINGS to express my sincere appreciation of his work, and that of the U. S. Naval Institute. So when suggestions are invited I hasten to comply. It does not seem wise to me to change the name from United States Naval Institute Proceedings to U. S. Naval Institute Magazine, even though the suggested title is at present the more accurate. The United States is still a young country where the value of tradition is frequently overlooked. The Navy has been a bulwark of tradition and any publication which furthers this end should retain its original title. The public can be educated up to the title. Magazine denotes commercialism, while the very novelty of the word, Proceedings, would attract the civilian and help to differentiate between such publications as *Yachting, Motor Boating* and other specialized nautical magazines. The *National Geographic* would be a far better pattern. Nothing should be permitted for a moment to detract from the dignity which its professional standard has gained for it, nor to lessen the effectiveness of its mission. The majority of commercial magazines have amusement as their function, while that of the PROCEEDINGS is primarily educational. The suggestion listed as number five is excellent. An appropriate half-tone on the cover would add a great deal to the attractiveness of the publication. This would require a heavier glazed paper, would it not? I have often thought that navy blue would be a far more practical and fully as appropriate a color for the cover than the present white which soils easily with continual use. Of course if suggestion number five is adopted white will be needed for printing half-tones.

The remaining suggestions are all excellent. Increasing the size of type would be appreciated by those who read while underway, on land or sea, and by those retired officers who do not "make as many revolutions as they once did." Increasing the page size could be put into effect at the close of a year, in order not to interfere with those who have their copies bound. Articles on professional subjects should be encouraged as heretofore, in order to fulfill the mission. But to attract the civilian reader, historical articles, biographical sketches, and especially the memoirs of naval officers, deceased or retired. Biography is by far the most fascinating form of history. Extracts from ships' logs are usually very graphic and can be used in connection with more recent events perhaps. I am not at all certain that you will be deluged with the suggestions you ask for. I am submitting my opinions in the hope that they may help add to the sum total from which the new policy will be formulated. The civil population needs to learn more about the Navy, especially about its peace-time functions. The public is astonishingly ignorant about naval matters. They must be properly educated.

Although I have not the right to vote concerning the recent proposals for bettering the PROCEEDINGS, I feel I may freely express an opinion on the subject.

To begin with: The aim of the Naval Institute is stated to be "For the advancement of professional, literary and scientific knowledge in the Navy." Accordingly, is it necessary that the associate membership be so greatly increased? Rather should we do our utmost to make the younger officers realize the benefits of the Institute and encourage their becoming members long before reaching the grade of lieutenant. From the time a young man receives his appointment to the Naval Acadmey he can derive untold advantages from the PROCEEDINGS. Therefore, it seems to me, steps should be taken to increase the attractiveness of the PROCEEDINGS, having in mind the men of the Navy first and then by so doing more civilians would find it appealing to them.

There are few civilians willing to give the time and energy necessary for a really active follower of the Institute's aims. It is far better to restrict the associate membership rather than increase it wholesale. I remember my pride when I was elected to associate membership. In those days there were few in my class. Today, associate membership is nothing more than being a subscriber to a circulation-campaigned magazine.

During the last few years I have frequently thought that the Institute was deviating from its original purpose by adding so many articles of a nature more fitted for magazines like the *Trident* and historical records. These, while appealing to civilian enthusiasts, do not follow the more important purpose of the Institute.

To change the name of the PROCEEDINGS would, in my mind, alter the entire idea of the Institute. Even though no meetings of the members now take place, the professional articles published are discussed in the Discussion department of the PROCEEDINGS. This is a repetition of the old meeting in a more convenient form. A civilian interested enough to become a member does not care whether the publication which he reads is entitled Proceedings or Magazine, but to me, personally, the former is much more attractive.

The addition of pictures and illustrations of unusual interest would be of immense benefit to the betterment of the PROCEEDINGS. However, I should add, these should be of professional interest rather than of interest to the civilian. Would not a picture of every new war vessel, foreign or American, be of use and interest to the active membership of the Institute? These would be of more help than numerous ones of such and such a ship anchored in such and such a harbor.

The use of the same size type for all the departments would certainly be an improvement.

Increasing the page size to that of the standard magazine would also be of help, especially if it reduces the increase in cost due to the use of larger type. This increase should be undertaken only at the end of a volume, for any change in the middle of a year would force subscribers to change their method of binding. I now count on binding two volumes a year, but should the page size be increased would mean having the two or three numbers of this volume already published bound separately from the ones to come in a larger size.

To change the cover of the PROCEEDINGS by the removal of the two seals would take away an individuality which would detract greatly from its present high standing. To me there is a great connection between the Naval Academy and the Naval Institute. The latter, supplying as it does many of the textbooks used at Annapolis has as great a semi-official connection as any organization could have. I have always thought the cover one of the most attractive features of the make-up of the PROCEEDINGS and consequently would hate to see it changed, especially to be replaced by a common-place illustration.

I am submitting these notes, not in a spirit of criticism but in a desire to see the PROCEEDINGS made a better and more necessary publication, and yet, as you say, "carry out the mission of the Naval Institute." I do not consider that mission to be the almost unlimited enrollment of civilians.

I am submitting herewith my suggestions as to the contemplated changes in the Naval Institute PROCEEDINGS which are apparently deemed necessary to increase the membership and circulation.

It does seem odd that the interest of the junior officers of the Navy do not respond to the matter of subscribing more readily than they do and in this respect I can only quote my own personal case which leads to the belief that this apparent apathy on the part of the junior officers is due to the fact that the Institute makes no organized or energetic effort to bring the PROCEEDINGS to their attention after they are serving actively. In my own case, I learned about the PROCEEDINGS through happening to see a copy belonging to my immediate superior, Captain Boyd during the war, and realizing the value of it subscribed.

The appointment of agents aboard every naval station and vessel is suggested, for every officer of the Navy should be in receipt of the PROCEEDINGS and should help to increase its successful propagation of important technical matters as well as fostering traditions of the service and keeping one up to date on matters of international importance and naval developments. In this respect there is no other medium through which more accurate detailed information can be had, and as a medium of intelligence the PROCEEDINGS is unsurpassed. It would work no harm as I see it to make it compulsory duty to follow the PROCEEDINGS, although this might invoke contrary opinions and disgruntled statements from those in opposition to such a step.

Also, it might not be a bad idea to place the PROCEEDINGS in open circulation through the news stand groups where greater circulation would make it possible to carry a greater variety of advertising matter with consequent increased income, where the real profit from a publication should and does come from, most general magazines suffering a loss where the cost of issuing and selling price per issue is concerned, but is offset through the total revenue figures of combined advertising and circulation receipts. You are most probably aware of this.

Relative to changing the name of the PROCEEDINGS, it is believed this would be a good idea in order to lose some of the apparently greater technical atmosphere which impresses the casual reader, and in this respect it is believed that a department dealing with the monthly historical and interesting routine of the various departments of the Navy, entirely non-technical in scope, would prove interesting. The name of the publication

ought to be along the line, for example, U. S. Naval Recorder, U. S. Naval Record, U. S. Navy, U. S. Naval Magazine, U. S. Naval News, in other words a name that would excite the general interest of the public readers and permit of its general circulation on the news stands as well as among the naval personnel who are interested in technical phases of articles as well as items of general interest. A special photographic section would be of particular interest.

It is believed that the advantages gained through the use of a larger sized page would offset the advantages of the present size in filing the monthly issues for future reference, which on second thought would really not be greatly different or difficult.

Relative to the front cover, it is believed that the printing of different series of historic incidents in the functioning of the Navy both past, present and future, would be more attractive and help to improve circulation than the present scheme of merely reproducing the same cover each month, in spite of increased cost, for the cover of a magazine does much to sell it, and especially on the news stands. Heroic actions of naval individuals such as those performed by our medal of honor men would also make very interesting covers, not only for civilians but for naval personnel as well. This leads to the suggestion to incorporate a section which would appeal to the enlisted personnel of the Navy who, it is believed, would respond heartily to a systematized campaign for members, especially if agents could be appointed on board every vessel and station to secure subscribers and sell the publication with proper monetary remuneration. This idea I believe to be of particular worth in fostering, as if successful it will not only increase the circulation but will perform a service for the Navy in indoctrinating the enlisted personnel with a true and wider idea of the scope of the work of the Navy and tend also to increase the respect for their officers through the enlightenment as to their responsibilities both technical as well as diplomatic and otherwise.

I fear that any comments from a civilian on the proposed changes in the form of the PROCEEDINGS of the United States Naval Institute will be of little value but as one interested in the Navy and the Naval Institute, I wish to submit a few suggestions. I have a complete file of the PROCEEDINGS which I have read through, so that if I have no other qualifications I am familiar with the publication.

I believe it would be a mistake to make too much effort to popularize the PROCEEDINGS. The Navy needs popular support, and needs it badly, but I doubt if it could be accomplished by changing the character of the PROCEEDINGS. Historical articles, yarns as suggested by Admiral Goodrich, and more pictures would add to the interest of non-professionals but it would not go far to spread public information in regard to the Navy. That must be done in another way and I think the way is through the newspapers and magazines.

Beginning with the building of the "new" Navy the public began to be interested. The daily papers contained many accounts of launchings, trial trips, armor tests, and gun trials. The magazines had many articles by naval officers. The technical journals had intelligent articles on ordnance, engineering, and design. The New York *Post* had a page of army and navy news every Saturday and it was real news. The New York *Herald* and the New York *Tribune* published daily a column of navy news and every week had special articles. By the time of the Spanish War the Navy was much in the public eye and while newspapers had altogether too much to say about the war and published things which should never have been in print, everyone knew Sampson, Dewey, Evans, Philip, Taylor, Gridley, Wainwright, and a host of others. The popular enthusiasm for the Navy lasted until about 1912 and compelled Congress to make large appropriations.

Then, for reasons not to be gone into here, the enthusiasm began to wane and the Navy lost ground steadily until the World War.

The Navy met the test of the World War in a wonderful manner. The Spanish War was nothing compared to the task of the Navy in the World War. Thousands of young Americans were enlisted and hundreds became officers, but at the end of the war our people had no understanding of what the Navy had accomplished and there was no enthusiasm for its rehabilitation. This was largely but not wholly because the Navy's work was done under cover. Few knew of it and fewer understood it.

Today it is all but impossible to learn anything of the Navy. A few newspapers publish orders and movements of vessels but, unless there is a disaster, there is no news. There are no stories about ships or men, no yarns such as that of the snake in the double bottom of the *Newark*. The service papers are filled with comments on pay bills, promotion schemes so complicated that no civilian can understand them, decisions by the controller and suits over dependent allowances but no news of the Navy. The Navy League failed completely when the Navy needed it most and a civilian today is left with no way of knowing what the Navy is doing.

If I am right in thinking that the Navy needs popular support, it will not be done by changing the character of the PROCEEDINGS. The Navy must get back in the newspapers and magazines. It must make its operations and people known; otherwise a decadence similar to that subsequent to the Civil War will recur.

As a personal explanation I might say that I am in no way interested in any paper or magazine. I thoroughly disapprove of the way many magazines and most newspapers are edited but they are the only channels through which to reach our people. They are used to promote pacifism, the League of Nations, and other dangerous doctrines. If they had more space occupied by navy news there would be less for objectionable matter.

Membership: New members not previously published:

Adams, P. T., Ensign, U.S.N.R.
Alexander, D. W., Ensign, U.S.N.
Beard, W. E., Mr.
Bellingham, H. J., Lieut., U.S.N.
Dobbs, H. F., Lieut., U.S.N.R.
Haman, C. W., Ensign, U.S.N.
Hewlett, G. E., Lieut. Comdr., U.S.N.
Lawson, R. S., Lieut., U.S.N.R.
Higgins, W. L., Mr.
Moeller, L. N., Lieut. Comdr. (CEC), U.S.N.
Morris, Fred., Jr., Lieut., U.S.N.R.
Musser, J. B., Mr.
Offutt, Milton, Mr.
Perry, E. B., Lieut., U. S. N.
Quay, M. S., Mr.
Smith-Hutton, H. H., Lieut. (jg), U.S.N.
Sylvester, John, Ensign, U.S.N.
Walker, R. J., Pay Clerk, U.S.C.G.

INSTRUCTIONS FOR CONTRIBUTORS AND MEMBERS

Articles The Institute desires articles of interest to all branches of the service, including the reserve force. Non-members as well as members may submit articles, and authors receive due compensation for articles published. **Compact, well digested articles are more likely to be accepted for early publication.** In accepting articles for publication, the Institute reserves the right to have such articles revised or rearranged, where necessary, in order to bring them up to the required standard of articles published in the PROCEEDINGS—the cost, if any, to be deducted from the compensation due the author.

Contributors are requested to observe the following special instructions in preparing articles for the PROCEEDINGS:

(a) In writing names of ships put only the initial letters in capitals and underscore the names. The underscoring signifies to the printer that the word is to be in italics. The same applies to names of publications. Foreign words not anglicized should also be italicized.

(b) In preparing tables and computations employing fractions, subnumbers, etc., do by hand that part which cannot be made perfectly clear by the typewriter.

(c) In typing the script use double space between lines.

(d) When a quotation is included in an article the editor should be assured by appropriate notation that the writer has carefully verified the quotation as presented.

Reprints Authors of published articles are entitled to twenty gratis copies of reprints.

Discussions Discussion of articles published in the PROCEEDINGS is cordially invited. Discussions accepted for publication are paid for at approximately one-half the rate for original articles.

Book Reviews As soon as practicable after the publication of books on subjects of professional interest, the Institute aims to publish authoritative reviews of them, reviewers being remunerated.

Address of Members In the past, many errors have resulted from the habit of changing an officer's address as soon as his transfer orders are published in the papers. No change will be made in the future except upon receipt of notification by the member concerned. Reliance upon the former method may, in extreme cases, mean a delay of almost four months. To insure the prompt delivery of the PROCEEDINGS and other communications from the U. S. Naval Institute, it is essential that members and subscribers *notify the Secretary-Treasurer without delay of every change of address.* No responsibility can be accepted for failure to receive the PROCEEDINGS, where members fail to comply with this rule. Changes of address should reach the Institute by the 20th of the month, to be effective for the issue of the PROCEEDINGS of the following month.